THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
The Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · The Railway Official Gazette

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (8 lines)

Annual subscription payable in advance and postage free
British Isles and Abroad.....£2 5s. 0d.
Single Copies.....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 79 No. 24 FRIDAY, DECEMBER 10, 1943

CONTENTS

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 4.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Christmas Holiday Travel Restrictions

THE Government request to avoid unnecessary travel at Christmas is being supported by the action of the various Government departments in making rules designed to serve this objective. It was announced in the House of Commons on December 1 that, on every day from December 23 until December 28, the number of long-distance passenger trains that each railway company will be permitted to run, and the total train mileage of long-distance passenger trains, will not exceed the number of mileage run on any ordinary weekday or Sunday, as the case may be, in December, 1942. Service leave is being adjusted to limit travel by members of the Forces, and to this end no leave or short passes will be permitted throughout the British Army at home for any distances exceeding 20 miles, to begin during the period from December 23 to 28. No outward privilege leave by rail will be granted during the same period, and no inward travel (returning to units) or privilege leave on December 24, 25, 27, and 28. It will be noticed that no restriction is placed on inward travel on December 26. Civil Servants are not to be granted leave between December 23 and December 28, unless they intend to spend it near their place of work. The arrangements for granting free or assisted travel to civilians (including evacuated Civil Servants, transferred Civil Defence workers, and relatives visiting evacuees) will be suspended during the same Christmas period. Moreover, the few remaining restaurant cars will be withdrawn from December 22 to December 28.

Our Heavy War Traffics

It has been stated freely by Government spokesmen that extremely heavy traffics are being handled on the British railways, and that the pressure is likely to increase in the immediate future. It is known that success is being achieved by intensive operation and that many lines are densely occupied with both passenger and freight trains, but such is the veil of secrecy over railway-operating figures in wartime that only occasionally is any statistical indication of traffic volume given. A recent survey, of which brief details were announced last week by the Railway Executive Committee, showed that no fewer than 284 trains were run in a period of 24 hours over the busiest stretch of double-line track, and that goods trains alone aggregated 7,200 wagons. Further details of the composition of these 284 trains are given at page 593. In another locality 245 passenger and goods trains were handled, and instances of 4,000 wagons being moved over a double line in 24 hours are frequently achieved. In addition to numerous passenger trains, and trains of war freights (thousands of tons of bombs and millions of gallons of petrol are used by the R.A.F. and the U.S. Air Force every 24 hours), the railways are working 1,100 "block" coal trains composed entirely of wagons of coal which are run direct from the collieries to the consuming areas.

Losses Averted through Railway Co-Operation

The drastic upheaval of commercial relationships throughout the world, resulting from war conditions, has resulted in some cases in unduly heavy hardship falling upon particular classes of producer. An example which came to our notice recently was that of the potentially serious losses to the banana *ejidos* (producers on common public lands) in Veracruz and Chiapas, Mexico, through lack of transport facilities, and it is pleasant to be able to record that these losses are being averted through the co-operation of the Mexican National Railways. According to a Presidential Order, the railways are supplying equipment as needed for transporting the banana crop to consumption centres or to the frontier of the United States. The National Bank of Ejidal Credit is communicating directly with the railways, supplying specific data as to transport needs. No railway equipment is supplied to private individuals or organisations until the needs of the Bank, the instrument through which the State functions in relation to the local Societies of Ejidal Credit, have been met.

Jurisdiction over the Buenos Ayres Midland

A new Decree of the Argentine Government declares, according to a Reuters message from Buenos Aires, that the Buenos Ayres Midland Railway, the concession for which was granted in 1904, is subject to the legislation and jurisdiction of the national authorities, and the Buenos Aires provincial authorities are given 60 days within which to cease all intervention in respect of the railway. The original concession of September 6, 1904, was granted by the Buenos Aires Provincial Government for a metre-gauge railway of 322 miles from Barracas al Sud (a suburb of the City of Buenos Aires) to Carhué, a junction of the Buenos Ayres Great Southern and Buenos Ayres Western Railways. For the construction and working of the railway, the Buenos Ayres Midland Railway Co. Ltd. was formed in 1906 as an entirely

independent undertaking. Since 1908, however, the line has been worked by the Buenos Ayres Great Southern and Buenos Ayres Western Railways jointly. The reason given for the Government Decree is that although the origin of the railway is based on a provincial concession and the lines are entirely located in the Buenos Aires Province it must be subjected to national jurisdiction as it is an instrument for inter-provincial commerce. Presumably, this is because of its close connection with the two larger railways. This action of the Argentine Government may be compared with the practice in the United States where the Interstate Commerce Commission has no jurisdiction over traffic originating and terminating within a particular State.

Overseas Railway Traffics

Some reaction in Argentine railway stocks, influenced by the proposal to extend the Central Argentine moratorium, was followed by a firmer tendency. Traffics for the 21st and 22nd weeks of the current financial year have been fairly good, except on the Buenos Ayres Western. Increases for the two weeks have been £39,846 on the Central Argentine, £29,700 on the Buenos Ayres Great Southern, and £5,820 on the Buenos Ayres & Pacific. The rise in expenditure shown in the reports of three of the larger companies for the past financial year, however, should check any undue optimism as to the results for the current year. Brazilian railway traffics continue their satisfactory expansion. For the period January 1 to November 27, 1943, the Great Western shows an increase of £243,800 in receipts and the Leopoldina one of £229,149, and the San Paulo for the 47 weeks to November 21 has an aggregate advance of £319,409. On the Antofagasta the total increase to date is £332,970.

	No. of week	Weekly traffics	Inc. or dec.	Aggregate traffic	Inc. or dec.
		£	£	£	£
Buenos Ayres & Pacific * ...	22nd	102,900	+2,100	1,997,700	+82,080
Buenos Ayres Great Southern*	22nd	183,360	+7,080	3,319,440	+289,020
Buenos Ayres Western* ...	22nd	56,640	−5,880	1,099,920	−24,660
Central Argentine*	22nd	164,193	+21,984	2,952,726	+245,946
Canadian Pacific	47th	1,234,400	+181,800	52,149,200	+7,118,600

* Pesos converted at 16⅔ to £

Aggregate gross earnings of the Canadian Pacific Railway for the first ten months of 1943 amounted to £48,472,600, an increase of £6,487,400 in comparison with the corresponding period of 1942, and the aggregate net earnings of £7,720,600 showed an improvement of £175,800.

Paddington : The Gateway to the East

The G.W.R. London terminus at Paddington has for so long been regarded as the Gateway to the West that the heading to this note may be thought, at first sight, to be a misprint. Yet, in wartime conditions, Paddington seems to have taken on a new rôle by becoming the London gateway for important travellers from the East. The current issue of the *G.W.R. Magazine* points out that it was at Paddington Station that our Prime Minister, Mr. Winston Churchill, was welcomed back to this country some months ago after his memorable first conference at Moscow with Marshal Stalin, and Mr. Anthony Eden, who recently returned from an important and successful mission to the same city, also completed his journey from the East through Paddington. A few days before Mr. Eden's return, however, Paddington Station witnessed a much more colourful event, when a regal welcome was given to the Regent of Iraq, Emir Abdul Illah, uncle of the boy King Feisul, upon his arrival on November 4, on a special visit to Britain to study this country on a war footing. As he stepped from the train he was met by the Duke of Gloucester, representing His Majesty the King, and Mr. Oliver Lyttelton greeted him on behalf of the Government. Sir Charles Hambro, Chairman of the Great Western Railway, and Sir James Milne, General Manager, were also on the platform for the arrival of the special train, which conveyed His Royal Highness and entourage from an airport. In fact, No. 8 arrival platform has become an intimate link between East and West.

Multi-Gauge Motor Trollies

Countries the railway systems of which are of various gauges should find units of equipment such as Fairmont multi-gauge gang, inspection, and trailer trollies very useful, especially as they are of simple construction. They are made to run on any gauge from 2 ft. 6 in. to 5 ft. 6 in. inclusive, and are particularly useful on military lines. Their adaptability is secured by the use of separate longitudinal frame members which can be bolted to the body at different distances from the centre line, and by the carrying (as opposed to driving) wheels having no conventional full-length axle, but being secured to the moveable frame members by bearings. The driving wheels run on a 1½-in. square splined axle along which they can be slid to suit various gauges, and on which they are prevented from moving laterally by two axle clamps. When on narrow-gauge track, the square axle shaft ends project through the wheel centres on each side of the vehicle. Change over from one gauge to another can be effected in 10 or 20 minutes by four or two men, respectively. The power units are of various types and range from 6 to 36 h.p.; transmissions vary according to requirements, but the final drive is nearly central and may be an endless cord belt for light units or a chain for heavy trollies.

Private Wagons in Portugal

The Portuguese Minister of Transport has issued regulations covering the running of privately-owned wagons over the main railway lines in that country, based on legislation enacted within the last year or two. The question is bound up with the terms under which the Portuguese Railways Company operates about two-thirds of the railway system. The new Order provides for the formal licensing of every wagon, after the purpose for which the owner desires to employ it has been duly investigated and approved, and establishes a control over rates and charges as between the railway and the owner and between the latter and others. Evidently it is intended to keep the number of these wagons down to a minimum, although the necessity for running a certain percentage is acknowledged. Conditions are formulated covering the running of such wagons in transit services, and the hiring of them abroad. A private wagon may be requisitioned by the railway authorities if necessity arises, under compensation duly laid down; similarly the railway may use an empty wagon against prescribed payment, provided that the time taken to send it to the destination notified at the time of dispatch is not thereby exceeded.

Transport and Military Movements

On Friday last members of the Institute of Transport were given some insight into the vast and complex transport machinery involved in the mounting of an overseas military expedition from this country. Brigadier Napier, Deputy Director of Movements, who addressed them, knows his subject from the inside, for he has been intimately connected with the branch of the War Office dealing with movements since the outbreak of war. On another page we give a summary of Brigadier Napier's address, from which it will be obvious that between the decision to mount an overseas expedition and the time in which it can take place a lapse of many weeks is necessary to allow for the planning and physical arrangements in connection with the transport involved. On the railways falls the main task of moving personnel, stores, and so forth, to ports of embarkation. Some indication of the magnitude of this traffic was given in the recent broadcast of Major-General N. G. Holmes, Director of Movements, War Office, when he stated that a movement of a division, complete with vehicles, required 140 special trains. Brigadier Napier explained how these trains, and other movements involved, were fitted in to the general scheme by co-operation between the civil and military authorities.

Co-operation for Passengers' Comfort

A curious feature of American passenger travel hitherto has been the reluctance of many railways to allow their passenger equipment to pass beyond the limits of its owner's metals. Apart from certain recognised through routes, such as those of the Pennsylvania, Richmond, Fredericksburg & Potomac, Atlantic Coast, Seaboard Air, and Florida East Coast Railroads between New York and the Florida coast resorts, or the well-known Chicago & North Western-Union Pacific combination between Chicago and the Pacific coast, practically the only through inter-railway running has been by the pool of sleeping cars owned by the independent Pullman company. It has been almost the boast of the city of Chicago, where the great eastern and western lines meet, that there is absolutely no through running, and east-west and north-south passengers must inevitably change trains there, and generally stations as well. Much the same conditions have obtained also at St. Louis. It is felt, however, that war operating conditions are breaking down many of these barriers, and that the lessons so learned must be applied to securing the greater comfort and convenience of through passengers when the war is over. A fine example of co-operation was given by the nine railways which, in the winter of 1942-1943, established a pooled service between Chicago and the Florida coast, by three different routes turn-and-turn about, with exactly corresponding starting and arrival times, and the lesson so given is worthy of wide imitation.

Critical Speed

Reference has several times been made in this journal to the calculations on locomotive performance put forward by Señor Martinez de Velasco in an article published last March in *Ferrocarriles y Tranvias*. The July number of our Spanish

contemporary gives prominence to another article on the same subject by Señor Manuel Villar, an engineer of the RENEE (National System of Spanish Railways). This author disagrees entirely with the findings of the first writer; using other formulæ he concludes that the critical speed at which limiting engine power is matched by the adhesive ability to utilise such power is far lower than was stated. Instead of being 51 km.p.h. the critical speed for the new "Santa Fe" type locomotives, series 5001-5020, is put at only 23·8 km.p.h. or less than half. The first writer obtained his comparatively high figure by allowing for a considerable diminution with speed of the friction coefficient between wheels and rail; he also assumed the horsepower as governed by boiler and cylinders to be within certain limits independent of speed. The recent discussion in London on Mr. E. C. Poultney's paper "Locomotive Power" showed that in England as in Spain, agreement on formulæ and methods of calculation is still far from being reached.

Locomotive Boiler Pressures

The prevalence among British main-line locomotives of boiler pressures of 225-250 lb. per sq. in., and in the Bulleid Pacifics even 280 lb., tends to divert attention from the considerable number of smaller engines which is still working with safety valves set to well below 200 lb. per sq. in. With the exception of those Gresley "A1" Pacifics which have not yet been provided with "A3" boilers working at 220 lb. pressure, none of these locomotives is engaged in the heaviest main-line traffic, but many 4-4-2 and 4-4-0 engines with pressures of 170-180 lb. per sq. in. are working in secondary express or semi-fast classes of passenger and freight traffic. The majority of these have superheater boilers; indeed, there was a time a good number of years ago when the cult of low pressure was closely associated with superheater engines. Further down the pressure scale the still smaller locomotives with lower pressures generally use saturated steam. These include such classes as the L.M.S.R. "3F" 0-6-0T shunter with 160 lb. pressure, tank engines on the Southern with 150 lb., and the ex-N.E.R. standard 0-6-0T on the L.N.E.R. working at a pressure of 140 lb. per sq. in.—probably the lowest pressure now found among the locomotives of the four group railways, and one which is shared, as far as our own records go, only by the "B4" class 0-4-0T engines on the Southern.

British Locomotives in Brazil

Considerable publicity is frequently given to the more popular types of locomotives, particularly those on the heaviest freight trains and on fast passenger work. On another page in this issue will be found a description of a special type of locomotive which was designed and built for the peculiar conditions obtaining on a branch line in Brazil, namely, the Cantagallo branch of the Leopoldina Railway. These engines provide a good illustration of the diversity of requirements which British locomotive manufacturers have to meet. The unusual physical conditions were not the only factors affecting the design, as the engines had to be capable of burning a particular type of fuel. It is refreshing in these days, when much is made of the competitors of the steam locomotive, to notice that a railway company orders steam power of up-to-date design, which it obviously considers will meet the needs and satisfy the conditions of its forward policy. Brazil, as an increasingly active member of the United Nations, is making a worthy contribution to the general cause and her railway communications system is being called on to bear the strain of growing war traffic. It is reassuring to know that British-built locomotives will be helping our Allies in their war effort.

A Right-Handed Signal

A friend who had been criticised by a railway enthusiast for drawing a British semaphore signal pointing the wrong way appealed to us and told us that there was such a signal at a station near London from which he occasionally travelled. We guessed correctly that he was referring to Purley, where there is a red-faced semaphore pointing to the right in full view of the up end of the platform. This is a survival from the Brighton days, when there were a few signals on that line, designated "stop shunting" signals, with arms painted red on both faces and with spectacle glasses on both sides of the lamps. They were used to regulate the working in shunting necks and normally stood off, as does the one our friend had seen. We imagine that very few remain. The signal at Purley is particularly noticeable, as it is mounted on a bracket post carrying some down home signals, and stands out in strong contrast. Similarly-constructed signals were to be seen on the old N.E.R., controlling movements in and out of siding outlet-points; and no doubt some of these are still to be met.

The Argentine Railway Problem

FROM time to time the question of the repatriation of ownership of the British-owned Argentine railways comes before the public, sometimes through unusual channels and not infrequently in novel form. At present the matter has been raised anew by an article in an Argentine newspaper to the effect that the present conversations between representatives of British railway interests in Argentina and the Argentine Government may be the first step towards repatriation of British-owned railways in that country. It points out that a large portion of Argentina's foreign bonds held in London are being withdrawn, and suggests that the current trend of Argentine trade may make necessary further operations of this kind. The annual report of the Central Bank of Argentina is often the medium of quasi-official views as to the repatriation of Argentina's foreign debt, both public and private, and the report for last year is no exception. Not for the first time, attention is drawn to the amount of blocked sterling currency in London, which, at the end of 1942, revealed a balance of 295,000,000 pesos. The precise amount, in sterling, is not disclosed, but, at the present official buying rate of $13.50 to the £, it is probably nearly £22,000,000. The Central Bank would prefer to see this balance reduced, amply guaranteed though it is by gold, and the view is expressed that it would be regrettable were the country, through disinclination to make the necessary efforts, to allow to pass this favourable opportunity of repatriating part of the external debt, whether public or private. The "private" debt is, of course, largely represented by public utility undertakings, the most important of which are the railways, to which specific reference was made in the same connection in the report for the preceding year.

The Central Bank renders a noteworthy service by explaining the banking transactions which led up to the accumulation of the blocked sterling balance in London, which is, at times, mistakenly believed to belong to the Argentine Government. In effect, the sterling was purchased, like any other foreign currency, by delivering to the sellers a corresponding amount of pesos, which, in turn, increased the volume of currency in circulation in Argentina. To utilise the sterling balance for the repatriation of foreign indebtedness, whether public or private, it is necessary to reverse the operation, that is, to return to the Central Bank the pesos created when the sterling was taken over. Thus, it would be essential for the Argentine Treasury to be able to count on those peso funds to allow possession to be obtained of such part of the sterling balance in London as would enable Argentine Government sterling bonds to be purchased.

Perhaps most enlightening of all, is the statement in the same official document that it is not possible, at the present time, to obtain peso funds by the issue of Government loans on the Buenos Aires market, which is hardly able to satisfy a part of the heavy borrowings to meet the requirements of the State. Hence, it is impracticable to contemplate further issues for the purpose of repatriating foreign indebtedness. It may reasonably be deduced, therefore, that there is little immediate prospect of the British-owned Argentine railways being bought out by the State, at all events in their entirety, not because it is not the policy of the Argentine Government to repatriate the ownership of the lines, but through inability to finance a transaction of such magnitude. As the report of the Central Bank further points out, apart from the issue of loans, the national Treasury has no orthodox method of obtaining funds, other than by taxation.

There is another alternative, so the report adds, which is believed to be worth examining. The suggestion is put forward that, instead of issuing pesos against the sterling arising from exports to Great Britain, a moderate part of such exports should be paid direct in sterling, without previous conversion into pesos. Such sterling, credited to the producers in the proportion considered convenient in relationship to the value of the products sold and exported, would be retained by them on deposit or utilised for the purchase of sterling bonds, which the national Treasury could exchange into peso bonds, subject to the limitations imposed by the local market. In this way, so it is stated, part of the sterling would be eliminated from the monetary system and, concurrently, the currency in circulation would be correspondingly reduced—a desideratum which, doubtless, is founded on the knowledge that, in Argentina, the amount of money in the hands of the public is out of proportion to the volume of commodities available for sale, with the consequent inevitable tendency for prices in general to rise.

The suggestion that sterling securities should be purchased by producers and exporters to this country hitherto has not found favour because sterling investments, other than certain British Government loans, are subject to British income tax, now at the rate of 10s. in the £, which has effectively prevented

investors, other than those resident in the United Kingdom, from purchasing such securities. Indeed, it is the principal reason why Argentines do not interest themselves, financially, in their own railways. Were the companies domiciled in Buenos Aires, with "peso" capital, and, consequently, not subject to British income tax, except as to holders resident in Great Britain, the market for the securities would be widened considerably and the discharge of Great Britain's debt to Argentina—by this time appreciably greater than the £22,000,000 previously quoted—would be facilitated. Perhaps most important of all, the Government and people of Argentina would be able to take a financial interest in their own railways, which might well lead to a more sympathetic attitude towards the undertakings than has been noticeable for so long past. Nor need we point out that the greater the amount of the shareholdings in Argentina, the less would be the loss on exchange to be faced in remitting interest and dividends to Great Britain.

Meanwhile, the gradual repatriation of ownership of the railways continues and the report of the Central Bank records that last year part of the blocked sterling balance in London was utilised to pay off the outstanding Transandine Railway bonds, the value of £365,700, which were issued in payment of the line when it was taken over not long since from the former British-owned Argentine Transandine Railway Company.

Passenger Priority

ALTHOUGH efforts have been made in many enemy and enemy-occupied countries to introduce schemes granting priority to one class of passenger over another, the efforts, so far as concerns railways, do not appear to have achieved any great measure of success, and in the case of British railways the Ministry of War Transport has consistently declined to make the attempt. Few will deny the wartime desirability of giving priority to essential traffic over pleasure traffic, but, directly the effort is made to define what is essential and what is pleasure, difficulties arise. It is the Government policy to regard leave for the Armed Forces as essential, and also limited holidays and recreation for war workers. The desirability of periodical visits to evacuated members of the family, and also of occasional homeward journeys of transferred workers, is recognised, and such persons constitute a substantial proportion of what the casual onlooker regards as pleasure traffic.

With local road transport, a considerable measure of success has been achieved in many parts of the industrial Midlands and North by establishing rough and ready standards of priority, based primarily upon the nature of the worker's occupation as certified by his employer, but even these arrangements are not without their snags, as exemplified by the fact that men and women of the Services who are stationed in the Manchester area are feeling aggrieved that they are now required to pay double fare on the all-night buses like ordinary casual passengers. Hitherto, serving men and women in uniform were charged the ordinary fare only; that is to say, they received the same concession as night workers who obtained the necessary priority voucher. This concession was withdrawn at the beginning of October, and officials of the Manchester Corporation Transport Department say that the decision was taken with regret because it was found that night workers, for whom the late services were originally instituted and who were entitled to some degree of priority, were being crowded out. The Department agrees that Service men and women are entitled to special consideration, and when they are accompanied by their kit, and are coming home on leave or returning to their units, they continue to be charged the ordinary fare, and the production of the leave pass entitles them to priority on the buses in the same way as the worker's voucher.

There are now, however, large numbers of Service men and women stationed in the Manchester area, and opportunities of reasonable entertainment and recreation keep many of them in the city until the late hours, with the result that the pressure on the all-night bus services is greater than it has ever been, while it is virtually impossible for the transport department to increase the services. The only way in which the department can meet the situation is to confine priorities and fare concessions to workers and to home-coming or returning men and women of the Forces. Priority is given to the holders of vouchers or leave passes up to 2 min. before the departure times of the buses. Although railway conditions, especially with long-distance travel, are not analogous to urban road transport conditions, such difficulties as these we have quoted are not without their interest as exemplifying the type of problem which results from any attempt to decide who is not "on war work" in a country engaged in total war.

Railways and the New Fire-Guard Order

THE issue of the Fire Guard (Business & Government Premises) Order, 1943, has necessarily involved some revision to the 4,000 railway fire-guard schemes throughout the country as from September 20 last when the new Order came into force. These schemes have been operated with most satisfactory results, and less than 2 per cent. have failed to operate. One of the most important features of the latest legislation is undoubtedly the introduction of the "Sector Plan" linking the N.F.S. with the fire-guard personnel of local authorities and business premises, and designed to ensure better co-ordination of the available fire-fighting forces. Under this arrangement, the area served by each N.F.S. fire station is split up into a number of sectors each in charge of a Sector Captain, who in turn is in charge of Street Party Leaders and the Business Premises Block Leaders in his Sector. All calls for N.F.S. assistance must be made by the Sector Captain or his deputy and the new organisation will thus eliminate duplicate requests for aid and at the same time allow of the prompt transference of reinforcements from point to point within a sector and, as necessary, from one sector to another. In view, however, of the vital character of the railway undertaking, it has been agreed that railway premises for which the Minister of War Transport is the appropriate authority may form sectors in themselves (importance and not size is the deciding factor) and be in charge of Sector Captains nominated by the railways. This modification ensures that at important railway premises the sole authority for deciding whether or not assistance can be rendered to neighbouring local authority sectors shall be the railway Sector Captain. Railway premises of insufficient importance to justify retaining them as separate sectors are designated block posts within local authority sectors.

The new Order also introduces fundamental changes in the recruitment of fire-guard personnel. Hitherto it has been the practice to share fire-guard duties outside working hours between all persons (both men and women) who were liable. The difference between duty at business premises and the maximum of 48 hours has been available to the local authority, but has not been taken up if the balance was small.

The new Order introduces two important alterations; first, women are liable for fire-guard duty only at their business premises outside working hours if the number of men is insufficient to cover the whole of the duties; secondly, the male fire-guards are to be formed into "fixed teams," each man performing at his business premises the maximum number of hours of duty for which he is liable and thereby becoming exempt from duty with a local authority. These "fixed teams" are required to be recruited by a prescribed method of selection, and any surplus men are made available to the local authority. Manifestly there are premises where it would be inappropriate to apply such a system and the Order makes provision that such premises may be excepted from the arrangement. The Minister of Home Security has given such a direction in respect of railway premises, and the practice of sharing the duties equally will continue to operate subject to certain modifications, notably the exclusion of women unless the number of men available is insufficient to cover the whole of the duties.

The Minister of War Transport, as the appropriate authority under the previous Fire Guard Orders, had already appointed Regional Fire Prevention Officers whose duties were to examine and approve all fire prevention schemes, and these officers will continue to carry out their obligations. In addition, the Regional Fire Prevention Officers are responsible for effecting inspection of the arrangements, either by personal contact or by the delegation of such duty to other responsible persons. The railway companies, in addition, have instituted inspections as well as arranging for the carrying out of frequent exercises among the railway fire-guard personnel. The Order also gives the Minister of Home Security the power to prescribe any area as a "special area," and to exempt women from fire-guard duties at business premises in the area so prescribed. In such cases the local authority becomes responsible for the whole of the fire-guard personnel, but it remains the duty of the railway companies to prepare fire-guard schemes and to carry out their obligations at any of their premises situated in such an area.

Provision is also made under the Order for a tightening up of the arrangements for supervision; fire-guard personnel are required to sign on and sign off duty and records are required to be available for inspection by accredited persons. It is also provided that the appropriate authority may require amplification of the fire-guard arrangements to include such Civil Defence Services as ambulance, first aid, messenger, decontamination, etc. Certain classes of aliens are also brought into the fire-guard arrangements, namely, British-protected persons, Stateless persons, aliens of enemy nationality who are exempted or partly exempted from the provisions of the Aliens (Movement Restric-

tion) Order, 1940, and nationals of certain allied and neutral countries. As in the case of the previous Orders, machinery is available for the legal enforcement of the new Orders, and failure to perform fire-guard duty by an individual is punishable by law.

The U.S.A. Freight Traffic Peak

THAT incomplete statistics can lead to misleading conclusions is illustrated by figures recently made public concerning the freight position in the United States. Since the beginning of the war, statistics have been published each week of the number of wagons loaded in previous weeks, and it might be supposed that this figure, fairly easily arrived at, represented the general traffic trend. For a long period the total rose fairly steadily, until it was well over the 900,000 mark at the end of 1941, but from then until the summer of 1943 it has shown, on the average, a distinct recession. For two reasons, however, this is a fallacious basis of comparison. One is that whereas in 1941 the average ton of American freight travelled 387 miles, in 1942 it travelled 450 miles, and 1943 is likely to see a further increase to over 500 miles. The second is the much better loading of wagons that has taken place since the enforcement of the Office of Defense Transportation's orders laying down minimum tonnages for "less-than-carload" freight, as well as in the loading of freight generally.

The actual ton-mileage figures thus show a trend in a direction precisely opposite to that of the individual wagon-loadings. Whereas in every month of 1943 from January to July inclusive the total number of wagons loaded was less than in the corresponding month of the previous year, by an average of 4·6 per cent., the ton-mileage of traffic moved during the same period rose by 20·6 per cent. The average load carried by each wagon increased from 37·56 tons (of 2,000 lb.) in 1942 to 40·61 tons in the first three months of 1943; and this improvement alone saved the use of 114,632 wagons and in effect reduced the number of individual wagon loadings by 652,944 in the first quarter of the year alone. The entire wagon stock of the country was moving an average of 47·7 miles a day in the first half of 1943, thus equalling the record achieved in 1942; but, due to the longer average hauls, the turn-round time of the wagons showed a slight tendency to increase from the minimum of 13·1 days of October, 1941; the figures for July and August, 1943, were 13·7 and 13·3 days respectively. The percentage of empty to full wagon mileage is still dropping steadily; from 37·3 in the first six months of 1942 it was down to 36·6 in the corresponding period of 1943.

It is believed generally that the final quarter of this year will provide the most critical freight test to which American railways have yet been subjected. As already mentioned, the number of wagon-loadings weekly was tending to fall until July, but since then has been moving sharply upwards, and there is every likelihood that the October, 1941, record of 922,884 wagons dispatched in a single week may be beaten. If this is so, with the heavier average contents of each wagon, and the longer wagon hauls, the strain on railway resources may well be imagined.

Buenos Ayres Western Railway Limited

TOTAL revenue in the year to June 30, 1943, was higher than in any year since 1930, and it is unfortunate that such satisfactory earnings should have been accompanied by an increase in working expenses which more than offset any benefit to be derived therefrom. By far the larger part of these increased expenses is directly or indirectly due to a factor over which the company has no control—the use of wood (or other inferior substitutes) as fuel. The cost of fuel and electric current was £243,932 more than in the previous year, and maintenance of rolling stock increased by £52,564. A remarkably high standard of service and efficiency has been achieved by the British and Argentine engineers and staff generally in circumstances of almost unparalleled difficulty. Passenger and public goods traffic increased both in quantity and receipts, but luggage and parcels brought in £9,626 less and live stock £53,531 less. The following table compares some operating figures :—

	1941-42	1942-43
Passengers	28,508,563	32,113,208
Goods, tons	2,550,050	3,427,600
Train-kilometres	9,401,000	—
Ton-kilometres	910,441,000	—
Operating ratio, per cent.	83·24	88·29
	£	£
Passenger receipts	957,793	1,021,846
Goods receipts	1,575,047	1,708,006
Gross receipts	4,004,878	4,138,747
Working expenses	3,333,896	3 654,150
Net receipts	670,982	484,597

Exchange differences of £266,830 have to be deducted from the net receipts of £484,597, and the total net income amounts to £413,775. Fixed charges, however, require £535,928 and the final result of the year's working is a debit balance of £122,153, comparing with a credit balance of £36,261 at June 30, 1942. Since the issue of the previous report interest payments have been made on the 4 per cent. and 5 per cent. debenture stocks, with the result that the interest on these stocks is now paid up to June 30, 1943.

Buenos Ayres Great Southern Railway Co. Ltd.

IN the year to June 30, 1943, the improvement of £1,074,781 in the gross receipts was almost entirely absorbed by the advance of £1,011,878 in working expenses. Direct fuel costs were £865,000 higher, following on an increase of £572,000 in the previous year. In addition, the use of wood for 80 per cent. of the fuel requirements necessitated the employment of extra staff in various directions, and was mainly responsible for the balance of the increase in working expenses. It takes over three tons of the poor and expensive wood fuel available to do the work of one ton of coal, with the result that at times as many as 2,000 wagons have to be used for carrying wood for the railway to the detriment of its general traffic. Road competition has not materially decreased in spite of the growing shortage of tyres and spare parts, but it is satisfactory that the receipts of £1,007,902 from general merchandise were £101,931 higher. Diesel railcars have been invaluable in the present crisis. Some operating figures follow:—

	1941–42	1942–43
Passengers	58,833,952	59,660,190
Goods, tons	7,954,172	7,949,180
Train-kilometres	23,284,000	—
Ton-kilometres	2,961,271,000	—
Operating ratio, per cent.	79·36	80·67
	£	£
Passenger receipts	2,731,561	2,879,216
Goods receipts	5,553,389	6,152,659
Gross receipts	11,067,826	12,142,607
Working expenses	8,783,046	9,794,924
Net receipts	2,284,780	2,347,683

From the net receipts of £2,347,683 an amount of £967,372 has to be deducted for exchange differences, compared with £1,003,922 in the previous year. The total net income available amounts to £1,447,101, which is insufficient by £273,912 to meet fixed charges of £1,721,013. The total balance at debit of net revenue account is now £1,205,985.

Central Argentine Railway Limited

FOR the year ended June 30, 1943, against the increase of £1,841,278 in gross receipts there was an advance of £1,027,992 in working expenses, due to larger contributions to the Railway Pension Fund and provision for renewals, to the higher cost of materials, fuel, wages and salaries, and to increased expenditure arising from heavier traffics. The fuel bill was £1,642,093 against £1,414,535 in 1941-42 and £741,817 in 1939-40. In merchandise there was a fall of 55·2 per cent. in tonnage and of 39·6 per cent. in receipts, but the 6,840,201 total tonnage of products showed an increase of 1,829,424, and the receipts of £5,598,710 therefrom were £1,568,876 higher. Wheat consignments totalled 1,874,748 tons, an increase of 1,193,741 tons, and brought in £1,200,101, or £743,495 more than in the previous year. The directors express their appreciation of the loyal services given under difficult conditions by all ranks of the staff, both in Argentina and London. Some operating figures are compared in the accompanying table :—

	1941-42	1942-43
Passenger receipts	£2,266,426	£2,728,108
Public goods traffic, tons	5,721,855	7,154,959
Public goods traffic, receipts	£4,870,569	£6,106,329
Livestock receipts	£446,713	£471,578
Gross receipts	£8,464,051	£10,305,329
Working expenses	£7,591,358	£8,619,350
Net earnings	£872,693	£1,685,979
Operating ratio, per cent.	89·64	83·64

Exchange differences accounted for £623,403, against £506,651 in the previous year. Sundry credits, amounting to £18,287, brought the total net income to £1,080,863. After allowing for debenture interest, etc., payment of which is subject to the moratorium scheme, there is a debit balance on the year's working of £154,622, which compares with a debit of £868,106 for the previous year. Payments were made on account of arrears of 4 per cent. debenture stock interest of 1½ per cent. on January 25 last and of 4½ per cent. on July 1 last. These have cleared the arrears of interest on this stock up to December 31, 1941.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Early Electric Traction

3, Ship Street, Brighton,
Sussex. November 15

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Mention of the Blackpool Conduit Tramway by your correspondent Mr. Kenneth Brown brings to mind that this was the first true electric street tramway in the British Isles. It was opened in October, 1885, and was operated almost continuously in its original form until June, 1899. The difficulties of applying electricity were unusually great because the line was situated on a narrow promenade on the sea coast and directly exposed to the full force of wind and tide from the Irish Sea together with drifting sand. The original conduit route on the promenade was about two miles in length, mostly single track with loops, and between 1895-1897 an inland spur about 1¼ miles in length and also on the conduit system was constructed *via* Lytham Road and Station Road to rejoin the promenade line.

Altogether there were 16 conduit cars of which 6 were remarkably heavy bogie double-deck type. What is believed to be the original No. 1 conduit car is still preserved as a museum piece by Blackpool Corporation and was inspected by the writer during September this year.

After conversion to the more orthodox overhead-trolley system in 1899 the original routes have continuously evolved until today they form an integral portion of one of the most magnificent light railway and tramway systems in the world operated by a beautifully maintained fleet of single and double-deck rail-coaches.

Tribute should be paid to the name of Holroyd Smith the pioneer of the old conduit tramway. It is to be hoped that Blackpool will celebrate its jubilee of electric traction in 1945 by running Holroyd Smith's original tramcar along its former routes.

Yours faithfully,
DONALD F. PHILLIPS

The Scope and Interpretation of General Railway Statistics

25, Green Lane, Northwood,
Middlesex. November 29

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I note, with interest, your comments on my letter, which you so kindly publish, in your November 26 issue. If I may suggest it, your comments now go much further than the subject of your first article, and, while rebuking me for "sweeping assumption" in one direction, "blithely" overlooking something else, and "carefully refraining" from comments on a matter which is no part of the "Scope and Interpretation of General Railway Statistics," you attribute to me certain assumptions for which there is no justification in my letter or in any of my writings. Then you "presume" that certain things would be necessary, which would result "naturally" in something else. It is not difficult for you to destroy arguments of your own construction, for a creator cannot be entirely ignorant of the weaknesses of his own creation, but it is surely not too much to ask that you will at least criticise me on the assertions I have made (and I cordially invite you to hit me as hard as you can) and not upon "these foolish things" of your own imagination.

There are one or two points on which I would like to remark. In your last paragraph, while stating that "obviously" I have none of the essential data as to tonnages . . . etc., you ask how I would propose to apply my general principle to a certain area. If I were to attempt such a thing, I would certainly be guilty of the folly described in your first article—of drawing conclusions from inadequate data. Believe it or not, I never make any statements which I cannot justify by figures which are open to all who can read them intelligently, but, to my regret, I cannot supply the intelligence with which to interpret them.

Then you make an observation about the small average size of consignments from one sender to one consignee; may I ask what on earth this has to do with either average wagon load or average train load? Does the engine worry whether a 500-ton load consists of "one consignor to one consignee" or of a million? Would you not agree with me, however, that "the small average size of consignments from one sender to one consignee, and the comparatively small number of towns between which heavy tonnages "pass" are the very factors which make it essential to concentrate the traffic from these towns on as few centres as possible; is not that the point for which I contend? It is because of these "basic" factors that concentration on a limited number of stations, instead of diffusion over a large number, is the paramount necessity, the basic factor, in the consideration of the post-war structure of transport. It is not a political, not a charging, problem, but an operating problem, and the very things you say in criticism of my ideas, gives them the greatest support, for which, amongst other things, I am grateful to you.

Yours faithfully,
FREDERICK SMITH

[Mr. Smith is referring to the Editor's note at the end of his letter in our November 26 issue which said: "Mr. Smith would founder on the rocks of practical difficulties. Although obviously he has none of the essential data as to tonnages, flow, and nature of traffic available, etc., it would be very interesting to see, broadly, how he would propose to apply his general principle of 500-ton train loads in 20-ton wagons to traffic from one of the eastern counties, say Norfolk, for which the concentration point would presumably be Norwich, indicating the probable effect on the arrangements at the local stations, both for short and longer distance traffic." In effect, Mr. Smith now admits that his scheme is based on assumptions and he cannot respond to our request. Readers can draw their own conclusions. We agree that "the small average size of consignments from one sender to one consignee" and "the comparatively small number of towns between which heavy tonnages pass" would certainly not worry the engine. We suggest, however, that they would worry anyone attempting to "build on a general structure of 500-ton trains with heavier trains where the traffic is heavy." Until Mr. Smith can show how his "secret weapon" would work this correspondence must be suspended.—ED. *R.G.*]

The Civil Service and Industry

5, Palace Mansions,
London, W.14. November 30

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—As one who has had first-hand experience in Government departments alongside administrative civil servants (my grading was equivalent to that of assistant secretary), has known them in private life, and has had parallel experience in business and professional spheres, may I pay my tribute to the admirable leading article under the above title which appeared in your issue of November 19? In general, it appears a fair and objective statement with much of which civil servants would themselves agree, based as it is largely on H. E. Dale's book, which I know has been widely read in the Service, and deserves the serious attention of the intelligent public. But there are some points which perhaps invite comment.

I am not sure that there is general agreement, as stated, that the higher civil servant is totally unsuited to exercise controlling functions in business, when one remembers such outstanding examples as Sir Arthur Salter, the late Lord Stamp (who was not even administrative but was trained in the old second division), and many another who could be named readily. It may be said these are exceptions, but it remains true that, after the last war, when business men and civil servants worked together, the latter were later tempted by large salaries to take responsible business posts (some to their credit refused) whereas business men (we all know instances) did not shine in the public service. No doubt this will happen again, despite Lord Woolton. The point is that, when the "frustrations" of departmental life are removed, the trained civil servant proves a first-class executive. And that brings me to the important point.

We *are* "inventing new organs of state"; we have done so in the fields of electricity, water, ports, London transport, broadcasting, etc. Even the postal service has been largely recast on business lines, and many large businesses and semi-monopolies are approaching public services in structure and function. There is no reason why this process should not continue and further develop under pressure of post-war conditions. Many of these new organs have a core of trained civil servants working under conditions of greater freedom and elasticity with no small measure of success. It remains to enable the younger officials to gain direct business experience. It is already seriously suggested in the Civil Service that assistant principals be granted a year "off" for this purpose immediately on appointment, and senior officials might perhaps occasionally be exchanged with business executives.

One department, admittedly in a unique category, the Colonial Office, does increasingly arrange for its personnel to gain first-hand experience and exchange with the Colonial Service. Its example could be imitated.

It is not correct that there is no remedy for departmental disputes except at Cabinet level. Inter-departmental conferences, many of which I have personally attended, are frequently arranged, and although they sometimes resemble a minor battlefield from which the protagonists emerge bloody but unbowed, generally a workable compromise results, and friction or incur-

sistency is forestalled. The method should be systematised and extended.

The shadow of Treasury control, however necessary in principle, as practised does loom heavily over all the departments.

There is much the civil servant can do within the limits of the present system to adapt it to modern conditions. Personally I answered all correspondence the same day direct without drafting, used the telephone freely, and reduced minuting to a minimum.

I think the railway companies had no cause to complain on the score of speed and efficiency of the work of the Railway Amalgamation Tribunal. We took special pains also to ensure economy, knowing that the cost of our work would be allocated between the railway companies.

Yours faithfully,
W. F. SIMNETT

Cylinder Back Pressure

43, St. Marys Road, Doncaster,
Yorks. November 24

To the Editor of The Railway Gazette

SIR,—I was very interested to read your note in *The Railway Gazette* of November 12 concerning cylinder back pressure on locomotives with short-travel valves. It is interesting in that, despite the back pressure that arises, the performance of certain of these engines is considerably better when driven in "the modern manner." An example occurred in the shape of a couple of runs over a very hilly stretch of railway in the West Riding district of the L.N.E.R. The engine concerned was one of the Parker's 0-6-2 tank engines built for the M.S.L.R., now working on the G.N. section of the L.N.E.R. This engine is in its original condition as far as boiler and valve motion design is concerned.

Two trips were made over the same route with precisely similar loads and conditions. The first, with a clean fire, well burnt through, was made with the regulator partially open with a steam chest pressure of about 90-100 lb. and a boiler pressure of 150 lb. On this trip, cut-off was probably in the 50 per cent. region, and under these conditions the engine used coal and water very heavily, although time was barely kept and pressure fell back at certain points to about 125 lb. On the second trip, with the fire in a dirtier condition than on the previous run, the regulator was kept wide open and cut-off brought up to about 20 per cent. Steam was consistently on the blowing off point, much less water was used, and time was kept with the greatest of ease.

These two trips are a good comparison and show that, on some of the old engines, the modern ideas pay best. Similar results were obtained on easier gradients with engines of the Robinson "Immingham" class and with the "C12" and "N1" classes of Ivatt tank engines. In fact, the "C12's" will not steam at all unless this method is used on a train of any weight, and they show to the observer on the footplate when they have been notched up properly by bouncing up and down at the chimney end. Drivers say that the engines are not working efficiently until they are bouncing, and this points to the regular use of short cut-offs on these early G.N.R. engines.

Yours faithfully,
RICHARD HARDY

The Neath Railway of 1698

London, W.C.1
November 15

To the Editor of The Railway Gazette

SIR,—Mr. Kenneth Brown's quotation from Mortimer's "The Whole Art of Husbandry" relating to the Neath Railway built at the end of the 17th century is particularly interesting in its sidelight on the use of sail power, but it raises the curious point that it describes the line as a rutway, saying "he loads his Coals in Waggons, for the Wheels of which he hath made Grooves or Channels to run in."

Apart from the fact that there is no evidence of the use of rutways in this country at that period, or indeed at any time subsequent to the Roman Occupation, other evidence of this Neath Railway strongly implies that its track took the form of wooden rails, upon which ran flanged-wheeled wagons. For example, in 1705, the Burgesses of Neath succeeded in securing a verdict from the Grand Jury at Cardiff that the wagonway was a "nusance," and in some evidence brought forward to rebut this verdict it was stated: "These waggon-ways are very common, and frequently made use of about Newcastle, and also about Broseley, Bentall, and other places, in Shropshire, and are so far from being Nusances, that they have ever been esteemed very useful to preserve the roads, which would be otherwise made very bad and deep by the carriage of coal in common waggons and carts."

Thus we learn that the Neath Line was similar to those in Newcastle, and the other places mentioned, where the evidence is overhelming that the railways had squared wooden rails to accommodate flanged-wheeled wagons. It is possible that Mortimer saw the line at the place where it crossed the highway from Neath to Cardiff, as here the road surface was doubtless made up to the level of the top of the rail, giving the impression of a rutway, as indeed still occurs with modern railways at level crossings.

Yours faithfully,
CHARLES E. LEE

Publications Received

Sweden : A Wartime Survey. Stockholm : The Royal Ministry of Foreign Affairs. London : The Swedish Legation, 27, Portland Place, W.1. 7½ in. × 5 in. 250 pages. No price stated.—The object of this little volume is to present to Anglo-Saxon readers certain aspects of Swedish life and activity. Broadly, it has been prepared on similar lines to earlier official year books on Sweden, but emphasises the particular problems—military; social, and economic—which have confronted Sweden since the outbreak of the present war. Sweden occupies the peculiar position that, although she is a neutral, she is "encircled" by German-occupied territory, and is compelled to adopt a wartime economy, and wartime protective methods, in view of the insecurity of her position from attack by Germany. The railways are labouring under the pressure of an enormous load of traffic, and goods traffic is at present the heaviest in the history of the Swedish railways. This is attributable mainly to the increased work entailed by the state of emergency, such as heavily increased military transport and the carriage of wood for fuel. New locomotives and wagons are being built as rapidly as material and labour will permit. Of all the transport services, the railways are least dependent on imported materials for their running and maintenance, and extensive electrification has had a far-reaching effect in this respect. In view of their key position, railways are accorded priority above all other services in the allocation of coal, where coal cannot be replaced by wood or peat. This volume gives a well-balanced account, in easily readable form, of current conditions in Sweden.

The A.B.C. of Southern Locomotives. Compiled by I. Allen and obtainable from him at 225-7, Laleham Road, Staines. 6 in. × 4 in. 48 pp. Price 1s. 6d.—Already it has been found necessary to bring out the 5th edition of this little book ; less than a year has elapsed since the appearance of the 1st edition, and it is understood that sales to date run to something like 13,000 copies. The new edition contains the lists, tables, and illustrations of the 4th edition, but there are one or two new illustrations and also dimensioned reproductions of the lettering and numbering on locomotives which have been given wartime finish. Another new feature of the book is a list of locomotive running sheds.

The A.B.C. of Great Western Railway Locomotives. Compiled by I. Allen and obtainable from him at 225-7, Laleham Road, Staines. 6 in. × 4 in. 40 pp. Price 1s. 6d.—This booklet is the second edition of a work originally brought out last August ; the latter was unchecked by the railway company and without illustrations, nevertheless the edition was exhausted within a month. Opportunity has now been taken to add illustrations of all the principal locomotive types, thus making the new edition a worthy companion to the A.B.C. of Southern Locomotives which has already been reviewed in these pages. Lists are given for every locomotive class together with the date of introduction, wheel arrangement, weight in working order, boiler pressure, cylinder dimensions, driving wheel diameter, and tractive effort. On page 15 is given the location and code of all locomotive running sheds on the system. Certain corrections have been made, but official confirmation will not be possible until after the war.

Electric Arc Welding Manual. Murex Welding Processes Limited, Hartford Road, Waltham Cross, Herts. 8¾ in. × 6 in. 128 pp. Illustrated.—This volume is one of a two-volume treatise which deals with welding technique. The material in this book relates to equipment ; the companion volume, now in course of preparation, will deal with welding practice. The complete work is intended as a guide to those who have not had experience of electric welding ; at the same time, it is sufficiently comprehensive to serve as a useful work of reference for the more experienced. Chapter 1 deals with the principles of electricity in much the same way as an ordinary text book ; Chapter 2 describes the characteristics of the electric arc. Descriptive information is then given about motor-generator and transformer welding equipment ; concluding chapters deal with the choice of suitable equipment and accessories ; also with the method of operation. At the end are several tables giving technical data.

The Scrap Heap

Business Brevity

A correspondent of *The Times* states that he recently received a letter from a well-known firm with the following instruction:—

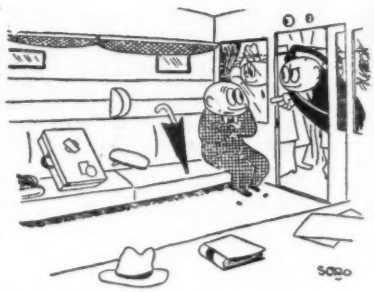
"In reply please quote E/09881/GD E/1765/CD O/8504/SD O/6855/CD DW/TL."

* * *

A remarkable story is told in the American *Railroad Magazine* of a woman who worked for 39 years in a responsible position in the carriage sidings of the Pullman Company at Washington, D.C., but in all that time never rode in a train, except on one occasion when a car in which she was working was picked up in error by the yard shunter and pulled along several city blocks. Miss Georgie A. Wheatley, who has just retired at 65 years of age, was in charge of the charwomen who service the Pullmans at Washington, and had prepared cars for millions of passengers, including seven Presidents of the United States. What is more, during her 39 years of service from 1904 onwards, she had trained a total of more than 2,500 Pullman employees. But, as she herself says, she "just never got around to riding a train."

* * *

Nearly one out of every four tons of freight hauled by United States railways in 1942 consisted either of raw materials going to steelworks or of steel delivered from the mills to war industries. During the year the railways hauled a total of nearly 1,421 million tons of freight of all kinds. Of that total, 251 million tons consisted of iron ore and other steel-making materials *en route* to steel plants. An additional 76 million tons consisted of shipments of iron and steel products from the steel mills to consumers. The total amount of railway freight going to and from the steel plants filled nearly 6,400,000 wagons.



"I have told you already that I like travelling alone"

From "Ferroviarios"

Four G.W.R. employees, whose ages total 265 years, have been repairing wagon sheets at the company's Saltney Works for 53 years.

* * *

A Ministry of Health "Rigmarole"

Proceedings for possession for rent arrears on instructions from the Ministry of Health were recently taken by the Southgate Borough Council. During the hearing a document from the Ministry submitted by the Town Clerk was read to Judge Gordon Alchin, whose comment was, "What a rigmarole."

The Ministry's document was:—

Whereas the premises wherewith particulars are set out on the schedule hereto attached are in possession of the Ministry of Health by virtue of Regulation 51 of the Defence (General) Regulations, 1939, and the council of the Borough of Southgate are, under authority of the Minister, using the said premises for the purpose authorised by the said regulation: now therefore the Minister being of opinion that it is expedient in connection with such use of the said premises so to do, hereby authorises the council to do in relation to the said premises, all such acts, including taking of any legal proceedings, as a person having an interest in the premises by virtue of which he is immediately entitled to possession thereof would, by virtue of that interest, be entitled to do for the purpose of securing the removal from the said premises of persons not entitled to occupy the same.

The Judge said that all the words after "now therefore" could be deleted and substituted by "authorises to recover possession."

* * *

Tailpiece

(*The railways of Russia are dealt with elsewhere in this issue*)

Over gallant Muscovy
Verge to verge the lines are set.
Scan the map that you may see,
Nor their purposes forget.
Wars are lost if transport fails,
Russian roads and Russian rails.

Death is busy night and day,
Rails are shattered, roads are mined.
Russian valour clears the way,
And the trains come up behind.
Each is great and each prevails,
Russian valour, Russian rails.

For the foe retreating fast
Dissolution has begun.
Soon the border will be passed,
And the remnant of the Hun
Fall like chaff before the flails
Of Russia served by Russian rails.

E. C.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

UNITED STATES

The Congressional Derailment

Detailed information is now available concerning the disastrous derailment, on September 6 last, of the Congressional express of the Pennsylvania Railroad, referred to in the September 10 and 24 issues of *The Railway Gazette*.

Traffic between Washington and New York has become so heavy that the Congressional runs in two sections, the first of which (or "First 152," as it is officially known) was involved. This train omits the Baltimore, Wilmington, and Philadelphia stops made by the main train, and, running about 10 min. ahead, is scheduled non-stop over the 214·8 miles from Washington to Newark, and to take 3½ hr. for the 224·8 miles from Washington to New York, an overall average of 64·2 m.p.h. As this includes all service slacks through the large cities passed, the sustained intermediate speeds are high.

On the day in question, the formation of the train was: combination baggage-van and coach, seven coaches, a two-car dining unit, five Pullman parlour cars, and an observation lounge—sixteen vehicles in all, with a total weight, probably, of about 1,250 tons. The locomotive was of the electric "GG1" standard type. The train had passed Philadelphia at low speed, and was on Track No. 1 at a point 3 miles east of North Philadelphia Station, near Frankford Junction; it was accelerating from a service slack, and speed was about 55 m.p.h. The accident was caused by a journal burning off on the leading bogie of the seventh vehicle from the locomotive. The coach left the track, and, rearing in the air, came in contact with a signal gantry, which sheared it from end to end and tore off the roof. The eighth carriage came into violent contact with the signal bridge, and was bent round bodily into a V shape. In these two coaches occurred the majority of the casualties, which were 79 passengers killed, and 103 injured, out of a total train complement of 541 passengers. Only the leading five and the trailing two vehicles of the train remained on the rails and undamaged; and apart from the two smashed coaches, and the dining car immediately behind them, the damage was relatively light. The bogie on which the journal failed was of standard friction-bearing type, and, with the rest of the train, had been subject to the usual detailed inspection before the train left Washington. The coach to which it belonged was not one of the usual set assigned to this service, which has roller bearings throughout, but had been added to handle heavy weekend traffic.

New Diesels for the Susquehanna

In previous issues of *The Railway Gazette* the way has been described in which the New York, Susquehanna & Western Railroad revived a moribund suburban traffic between Hoboken terminal and Paterson, New Jersey, by putting into service, in July, 1940, two 80-seater diesel-electric railcars. At the same time, the run to Hoboken, which had involved ferrying across the river to and from New York, was abandoned, and a connecting motor-coach service was established between a new Susquehanna Terminal and Times Square, in the heart of New York, by way of the new Lincoln Tunnel. The transit time between Paterson and New York thus was cut from 65 to 35 min., and the train service has grown from 20 steam trains to the present service of 68 trains daily.

The crowding of the 80-seater diesels made additional accommodation necessary, and late in August this year a 140-seater twin-diesel unit was put into service, for use in the morning and evening rush hours. It was built by the American Car & Foundry Company, and is of a completely modern type, with reclining-chair seats and air-conditioning. Power is provided by six-cylinder engines of the Waukesha-Hesselman type, each developing 210 b.h.p. at 1,800 r.p.m., of which two are installed on each coach, making a total of 840 b.h.p.; this is sufficient to accelerate the unit to 73½ m.p.h. in 2 min. from a dead start, and in a distance of 3 miles. The unit can be separated, and the two vehicles used independently, when required.

The Colorado Eagle

Authorisation has been given by the District Court of St. Louis to the Missouri Pacific Railroad for the purchase of a diesel-electric locomotive and six lightweight passenger coaches for service between St. Louis, Kansas City, Omaha, and Denver, doubtless to supplement the company's popular Colorado Eagle streamline service, which came into operation in 1942. If the War Production Board should give facilities for construction to proceed, it would represent the first building of streamline stock in North America since the United States entered the war.

ARGENTINA

Railway House-Building Loans

As a result of numerous petitions addressed to the Minister of Finance, asking that the interest charged on house-building loans to railway employees granted through the Railway Pension Fund be reduced from 6 to 4 per cent., it is announced that this concession has been granted. The petitions in question were forwarded by the Minister of Finance to the Pensions Board; after studying the question, the board officially notified the Minister that it has resolved to reduce the interest to 4 per cent. per annum, the concession to be retrospective.

Institute of Transport Meeting

The meeting on September 7 of the Argentine & River Plate Centre of the Institute of Transport took the form of a "brains trust" session, when questions which had been submitted previously were replied to by a committee composed of Messrs. M. F. Ryan (General Manager, Buenos Ayres & Pacific Railway), P. Goddard (Traffic Manager, Central Argentine Railway), R. Veitch (Local Chairman, Chadwick, Weir & Company) and F. Lewis (Manager, Compañia Internacional de Transportes Automobiles).

As to the future of the Argentine railways, Mr. Ryan gave his opinion that they would have to shorten their journeys, and, by improving their second class coaches, aim at providing more attractive transport for the masses, leaving air transport for those passengers who did not mind the extra cost. He outlined some of the plans being studied for post-war modernisation, which tended towards the provision of faster services. Mr. Ryan expressed himself as being optimistic in respect of the post-war possibilities of the Argentine railways, provided their financial position improved. Otherwise, should there be unregulated road competition and a strongly-subsidised air-transport system, the railways eventually would disappear.

As for the advisability of the railways embarking on a large-scale rolling-stock programme, Mr. Goddard usefully pointed out that Argentina was a country eminently suited for air transport. He added that at present the railway companies, in view of their unsatisfactory financial situation, were not in a position to invest in rolling stock, and were engaged on the improvement of their existing material.

Mr. Lewis held out little hope of a solution to the road-rail problem except by means of a federal law embracing all forms of transport, administered by a federal body with provincial and inter-provincial jurisdiction.

Mr. Veitch answered questions relating to the future of British shipping, and other queries concerned the bulk loading of grain on railway wagons, and methods of opening up territory. On the latter point, Mr. Ryan stated that the railways needed bulk traffic to make the effort of opening up territory a paying proposition. He cited the example of the Province of San Luís, where lines had been constructed into the forest zone for the transport of wood, of which approximately 2,000 tons was produced daily.

Under the head of job analysis, Mr. Ryan explained how that system worked on the B.A.P.R., citing the case of Junin, where it had been tested first. Each operative on the station staff had had to fill in a time sheet stating his work in detail by the hour. The sheets had been studied by a traffic-efficiency expert, who had been over the whole operation of the station, checking the timesheets with it, with a close watch on overlapping and wasted time. The test had shown that, out of a total of 97 employees, 22 should be eliminated, and five added, giving a net reduction in staff of 17 men. Mr. Ryan pointed out that a fundamental point in the plan was that no man should be discharged from the company's service, but transferred to a position in which his services could be employed more effectively.

SWEDEN

Halmstad-Nässjö Railways

The Halmstad-Nässjö Railways Company owns and operates a standard-gauge steam-worked line between Halmstad (a port on the west coast of Sweden halfway between Gothenburg and Malmö) and Nässjö (on the Malmö-Stockholm main line). For the year 1942 the company returned total receipts of kr. 9,700,000, compared with kr. 8,300,000 for 1941; of the total receipts, kr. 700,000 was accounted for by the company's road-motor services. Expenditure rose from kr. 7,600,000 in 1941 to kr. 9,100,000 in 1942, of which sum kr. 500,000 was in respect of road services. The net profit was kr. 600,000 (kr. 680,000); inclusive of the profit balance from 1941 an amount of kr. 970,000 was available for distribution. A dividend of 7 per cent. (the same as for 1941) was paid.

Aviation Plans

Of the schemes being discussed in Sweden for the development of internal and international air services, that for the establishment of an air line between Stockholm and Haparanda, in the northeast on the Swedish-Finnish frontier, is considered the most important. It would constitute the backbone of an extensive system of feeder lines from the western parts of northern Sweden, where there are few railway lines. Intermediate stops are planned at all important towns along the coast of the Gulf of Bothnia.

Fuel Economy on the Railways

Some practical means of effecting savings in workshops of Chief Mechanical Engineers' departments

AN inter-company fuel & power conference was held in the Conference House of the Chamber of Commerce, New Street, Birmingham, on December 8. It was opened by the reading of a paper dealing with fuel economy in the Chief Mechanical Engineer's workshops by Mr. K. J. Cook, Locomotive Works Manager of the G.W.R., Swindon. Mr. F. C. Hall, Principal Assistant to the G.W.R., presided. Some abstracts from the paper are given below.

The railways of Great Britain are probably the largest consumers of coal in the country, and use a total of some 16 million tons. Approximately 14½ million tons are burned in locomotive boilers to generate the power for the railways main function of transport. The field under review at the conference is that comprehensive group of large and small workshops in which the engines and other rolling stock of the four British railway groups and of the railway section of the London Passenger Transport Board are repaired and much of it built. Individual works vary in numbers of staff from 100 to 6,000. These workshops also carry out a very large amount and variety of work in manufacturing or maintaining the ancillary plant, including points and crossings for permanent way, rail chairs, breakdown cranes, manual and power cranes for traffic and dock purposes, coal hoists and tips, lock gate machinery, lifts, water tanks and water cranes, steamship parts, turntables, etc. The processes vary considerably but, in total, they include heavy and light machine shops, locomotive and other rolling stock, erecting shops, boiler shops, smithies, forges, drop-stamping shops, ferrous and non-ferrous foundries, steel-melting shops, rolling mills, sawmills, electrical shops.

Of the 1½ million tons of coal, approximately 350,000 tons is used in the Chief Mechanical Engineers' Workshops. In addition, the equivalent of approximately 117,000 tons is utilised in the workshops in the form of electric current and 75,000 tons in the form of coal gas. There is also a considerable quantity of purchased coke both foundry and gas coke, and several thousands of tons of fuel oil and creosote pitch. The total quantity of fuel used is approximately 600,000 tons.

In some works fuel investigators have been appointed. Their duties are to keep in close touch with the methods in which fuels are consumed ; on the extent to which fuels are used with the object of reducing any unnecessary use of fuel ; the efficiency of fuel using appliances ; or to give any assistance in reducing the quantity of fuel required to carry out work efficiently.

The scope for economy of fuel lies in two main directions. First, by attention to the details of combustion and operation to ensure that the minimum quantity of fuel only is consumed and that it is consumed efficiently. Second, by the intallation of schemes or lay-outs which have been, or are carried out with the prime or incidental objects of reducing the quantity of fuel required. These latter schemes are able generally to make very considerable contributions to the economy of fuel but are more long-term policies, whereas those in the first category are the more daily concern of the fuel investigators and watchers and likely to show the more immediate return.

Fuel in one form or another is required in many fields but may be divided principally into the following : lighting, workshop heating, water supply, power (electric, hydraulic, pneumatic) process heating.

It is not uncommon for individual shops in the C.M.E.'s works to range in area from one to ten acres. An example was recently checked in a gas-lighted shop where the hourly gas consumption was 5,000 cu. ft. To illustrate the meaning of this it can be converted in terms of coal to one ton every 3⅛ hours. Although there will be a production of a certain quantity of coke on the credit side, the illustration emphasises the necessity of avoiding the unnecessary use of lights, particularly outside working hours or when shops are operating in sections. Factory Act legislation, accentuated by blackout conditions, in recent years has increased considerably the requirements of lighting intensity which, in turn, increases the expenditure of fuel.

The principal heating medium in railway workshops is steam from stationary boilers and there is considerable scope in lay-outs of new installations to obtain satisfactory heating with the minimum expenditure of fuel. In many of the older shops, steam-heating pipes laid in races formed the arrangement. Welded joints over extensive lengths have greatly reduced loss by steam leakage at joints, and return pipes conveying the condensate back to boilers have provided hot feed water. Later arrangements have included thermostatically-controlled unit heaters blowing hot air over steam coils.

Railway workshops frequently broke new ground and had to provide all the services required. Hence it was not uncommon to generate the electricity required. In later years, most works have fallen into line with national economy and obtained the benefits of mass generation through the grid. Electricity consumption in C.M.E.'s workshops amounts to 146 million B.T.U.s annually—a saving of 1 per cent. represents 1,200 tons of coal.

The consumption of fuel for process heating is extremely large as the maintenance of railway rolling stock in the main necessitates the use of large parts, such as steel forgings, rollings, castings, pressed plates, and the consequent processing in heat-treatment, hardening and tempering, etc.

Opportunity is taken in replanning the equipment of sections of works to modernise the plants and, during this process, many schemes, which have a very direct bearing on the consumption of fuel, have been incorporated.

Observation of blackout regulations has required an almost continuous use of artificial light. Many schemes of removable shutters and roof screens to replace the hastily enforced painting of roof and side lights has improve shop conditions and enabled considerable numbers of lights to be dispensed with during hours of daylight. The process is continuous and numerous schemes saving several hours lighting a week have been installed.

In one case a large gas lighted building was used as a cycle store. The principal usage of the building occurred at set times, but small intermediate requirements prevented the lighting being extinguished. Electric lighting controlled from gatekeepers' office was substituted and enable lights to be off except when required, and 6,000 cubic feet of gas a week was saved.

Examination of the lagging of steam service pipes frequently reveals previously unsuspected losses and steam traps require constant care. Further points are the motors driving line shafting. Modification of drive may enable a smaller motor to run independently.

An inferior type of fuel utilised at any furnace or boiler also contributes to the desired end. Such substitutes may be wood refuse, mixtures of coal and coke, salvaged coal or coke, small coal in place of large, opencast or outcrop coal. More can be done in railway workshops by the use of inferior coals, coke, etc., to release large coal and special steps are being taken to reduce materially the use of large coal. Other often unsuspected sources of benefits are in seeing that coal and coke wagons are completely emptied before loading them with such things as ashes or clinker, that partly burnt fuel is not carried away with ashes and clinker.

As individual shops were built, it was frequently the practice to instal a locomotive-type boiler, mounted as a stationary boiler, to provide heating for the shop in question. In recent years, a large number of individual boiler stations have been superseded by the installation of modern water-tube boilers with mechanical stokers in central positions and conveying the steam over a wide area through heat insulated mains. This has enabled very much lower grades of coal to be utilised under conditions of fuel combustion control and the concentration of a number of larger units at one point allows of units being brought on or off the steam line to maintain the most economical combustion rate. Fuel consumption per lb. of water evaporated within a certain range rises with an increased rate of evaporation. If a boiler has to be pushed in order to provide the necessary quantity of steam, the fuel consumption relative to steam or heat produced rises, and there is a reduction in the efficiency of the utilisation of the coal. In a Central Boiler Station, one stand-by boiler can be brought into service and spread its effect throughout the whole of the system.

To gain further benefit from constant rate of firing an installation of a steam accumulator (Ruth's System) has been made in one instance and is being installed in another. Certain conditions are necessary to make a steam accumulator an economical proposition, the principal being that steam supplies shall be required at two different pressures. The accumulator consists of a large capacity cylindrical steel reservoir with hemispherical ends, heavily lagged and protected by heat insulation. The accumulator is located between the high pressure and low pressure steam mains and is normally 90 per cent. full of water ; the remaining 10 per cent. is steam. When the steam generated by the battery of boilers is in excess of immediate requirements, the surplus steam is admitted to the accumulator increasing the pressure until it reaches the boiler pressure. On the other hand, if the demand for steam exceeds the steam generated, the surplus is provided by drawing from the accumulator.

Reduction of scale-forming matter in the boiler feed water can be obtained by softening the water but the greatest benefit occurs by combining the treating of feed water with the provision of what is known as continuous " blow-down " apparatus operating from the boilers. This entails a small continuous flow of water and suspended solids from a point of concentration in the boiler.

In one installation of water tube boilers it was necessary to take each boiler out of service for scruffing after 300 hours of working. Now, in stages, this time has been extended to 5,000 hours and even after this period there has been less than 100 lb. of scale removed from the boiler.

(*Continued on page* 583)

The Railways of European Russia

Some account of lines opened in recent years, especially since August, 1941

NOT least among the surprises that Soviet Russia has given to the rest of the world since the German and Roumanian invasion of her territory on June 22, 1941, has been the efficiency of the Russian railway system as a means of wartime communication. Three years ago there was no major railway system in the world of which less precise information was available than that of the Union of Socialist Soviet Republics. Even the total route mileage and approximate strength of rolling stock were matters of which only the broadest indication could be given, in the absence of any official Russian statistics. Now that we have been Allies for nearly 2½ years, slightly more precise information is available, but it is still not possible to describe the Russian railways in a comparable way to those of other major countries. To a large extent this has resulted from the unusual geographical, economic, and political background of Russian railway development. The vastness of the country, the varying climate, and geographical conditions, and the sparseness of population and of development in many parts, have resulted in a large proportion of the railway mileage in Russia being essentially designed for colonisation and strategic reasons. Such railways have been built as economically (of labour and material) as possible, and these are often lightly-laid single-track lines with fairly heavy grades and sharp curves.

Excepting on a limited number of main lines, chiefly in European Russia, passenger traffic has been a minor consideration even in the years before the present war, and on most lines the passenger service has not exceeded one or two trains a day, calling at all stations. During that period the Soviet Union was occupied so extensively in building up a strong industrial position, taxing the railways to their utmost to handle the continually-increasing goods traffic, that passenger travel has been discouraged. In fact, long-distance passenger train services, which had been restored gradually in the years immediately after the revolution, were curtailed in 1935, and there was no material change in, or improvement of, passenger schedules after that date.

These remarks are not intended to convey that passenger traffic was insignificant in volume, but that it was a secondary consideration of the State Railways Administration. In 1938 the Soviet railways are officially stated to have carried some 1,177 million passengers. These are divided into two categories, namely, suburban and long-distance. Suburban passengers are those making journeys of under 50 km. (31 miles), and the average length of journey of such passengers was 24 km. (15 miles). Long-distance passengers comprised all those making journeys exceeding 50 km., and the average length of journey was shown some years ago as 227 km. (141 miles). On those long-distance routes which were sufficiently short to permit of it, namely, up to some 500 miles in length, practically all the passenger trains were run at night, and there were hardly any day services. For example, on the main Moscow-Leningrad main line, 404 miles, there were 7 fast night trains each way, but during the day there was not a single fast train, and only 1 all-stations train which covered a part of the journey by day. Then, on the Moscow-Gorki line 273 miles, there were 3 through night trains each way, but the day service consisted of only local trains on various sections of the line, but none running through.

Passenger trains are graded into six categories according to their speed, the accommodation provided, and (in three cases) the supplements charged. The categories are as follow :—

1—Express 2—Courier 3—Fast	All formed of bogie corridor carriages. Supplements payable by these trains.
4—Slow 5—Postal 6—Goods, with passenger accommodation	No supplements. Most have both "hard" and "soft" accommodation.

Although treated as a separate category of train, the Express was actually confined to the pair of Red Arrow expresses between Moscow and Leningrad, which were the fastest in the Soviet Union, and were formed of the latest convertible day and night carriages and sleeping cars.

The Courier category comprised only the Trans-Siberian expresses and those running between Moscow and the Polish frontier at Niegoreloje (beyond Minsk).

Of the two well-known classes of accommodation, designated "hard" and "soft," the former corresponds to the familiar wooden-seated Continental third class, and the latter to the Continental second class or British third class. Various long-distance trains, for which supplements are charged, have convertible accommodation to provide for sleeping at night. The vehicles are electrically lighted and have hot water, but they are heated by a separate stove in every vehicle, as steam heating from the locomotive is not practicable in a climate where the severe cold of winter makes flexible connections unworkable. "Soft" compartments seat 6 or 8 persons by day and are convertible into 4 sleeping berths; "hard" compartments normally seat 10 by day and are convertible into 6 sleeping berths.

In addition to the convertible cars, which are owned and operated by the Soviet State Railways and for the use of which a supplement is payable, there are proper sleeping cars on some of the more important long-distance trains. These are mainly vehicles taken over after the last war from the International Sleeping Car Company. They are worked by a subsidiary organisation called the National Sleeping Car Trust, and the supplements for their use are based on distance and type of accommodation (either 2-berth or 4-berth compartments).

Restaurant cars are included in a limited number of important trains, but this type of service was reduced substantially in 1935. The vehicles, which also are mainly those taken from the International Sleeping Car Company, are worked by a subsidiary organisation called the Trade Commissariat for Working Restaurant Cars & Railway Restaurants.

We mentioned earlier that only approximate figures could be given, and it is subject to this proviso that we record the following general indications of the size of the Russian railway system :—

The broad-gauge (5-ft.) mileage in July, 1941, is understood to have been approximately 87,000 km. (54,000 miles) in the U.S.S.R. proper, and 16,000 km. (10,000 miles) in those territories taken over since September, 1939, such as Estonia, Lithuania, Bessarabia, and parts of Poland and Finland. Some 4,000 km. (2,500 miles) were opened between the beginning of 1933 and the time of the German invasion. In addition, a substantial mileage was under construction, surveyed, or projected, as indicated on the maps we published in our issue of August 1, 1941, pages 108, 109 and 110. Since then, various important sections have been opened, such as Saroaka to Obozerskaya (linking the Murmansk and Archangel lines); Velsk to Kotlas and Vorkuta (serving the far North-East); Volsk to Saratov and Stalingrad (paralleling the River Volga); a branch from the Astrakhan main line to Leninsk (opposite Stalingrad); a link along the Caspian Sea from Astrakhan to Kislaia; the completion of the Black Sea coastal line between Senaki and Tuapse; two important links in the approaches to Leningrad, one on the south, completing the line from Novgorod to Soblago, and the other to the east, between Cherepovets and Vesyegonsk, providing a further alternative route between Moscow and Leningrad; a connection just east of Kazan (Derbishi-Bugulma) linking two great west-east routes; another cross-country link, still further east, between Kungar, Ufa, and Magnitogorsk; and north-south connections between Orsk and Kandagach, and between Besentzchuk and Pugachev.

In the neighbourhood of the Crimea the German and Roumanian occupying authorities have built some lines (on standard 4 ft. 8½ in. gauge). The first of these, believed to be on a formation previously built by the Russians, is from Aleschki (opposite Kherson) to Jankoi, across the Perekop Isthmus; this is stated to have been completed by the Germans. On the other side of the River Dnieper, between Kherson and Odessa, two short sections of railway are now known to have been built by the Roumanian occupation authorities in the Ukraine; these are Nikolayev-Bug, and Trihati-Kolosovka

(*See map on pages* 584-5)

Fuel Economy on the Railways

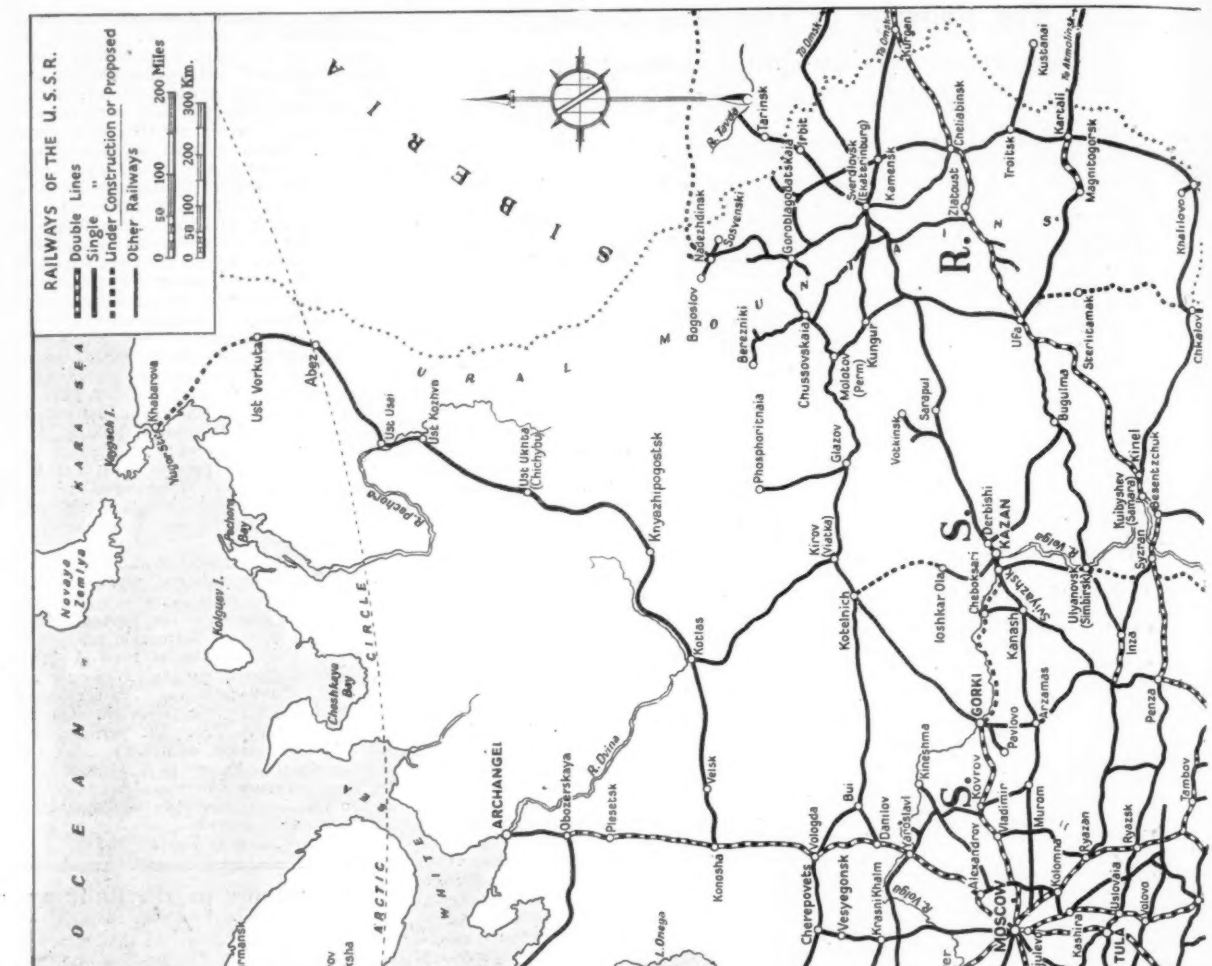
(*Concluded from page* 582)

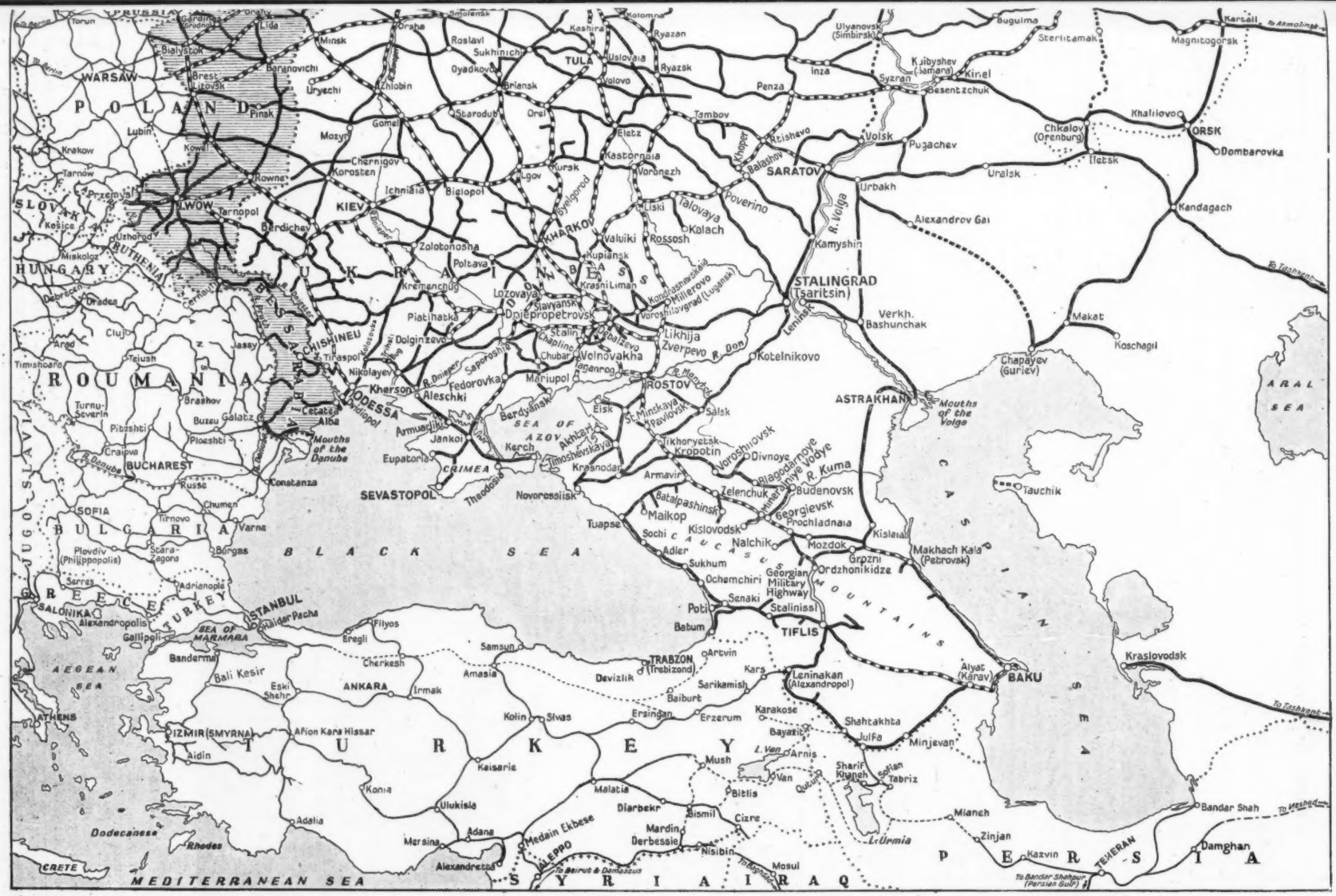
which is only a fraction of that removed after 300 hours in the previous circumstances. The benefit of this in fuel economy can be seen in the fact that a large amount of coal is necessary when lighting up a cold boiler before steam pressure is reached to enable the boiler to be coupled in to the line but, if the boiler is continuously in service, this coal is saved every two, three, or four weeks.

In one works, there is one type of boiler which cannot be accommodated on the steaming plant and has to be lighted up individually. This requires approximately two tons of coal for each test, whereas the average coal consumption for steaming all the other boilers centrally is 21 cwt., a reduction of 300 tons of coal a year.

A large field for the economy of fuel is opened by the investigation of methods of control of the temperature of furnaces. The avoidance of fluctuations of heating is of great value when fuel is consumed in furnaces. In one large installation automatic control of temperature was put in with the primary object of reducing the fuel consumption and, in this case, the results exceeded all expectations. It was originally put in to control the temperature of one gas-fired furnace used for the manufacture of laminated springs and the installation resulted in a reduction in the gas burned per ton of springs by 4,000 cu. ft., which is in the neighbourhood of 20 per cent. Subsequently automatic control was extended to 27 furnaces in the same shop. The cost of approximately £2,500 was recovered by direct saving in gas within 18 months.

The annual economies secured during the war have been at least 54,000 tons.


RAILWAYS OF THE U.S.S.R.
Double Lines
Single "
Under Construction or Proposed
Other Railways
0 50 100 200 Miles
0 50 100 200 300 Km.
ARCTIC OCEAN
KARA SEA
SIBERIA
URAL MTS.
U. S. S. R.
FINLAND
SWEDEN
ESTONIA
LATVIA
LITHUANIA
EAST PRUSSIA
POLAND
ARCTIC CIRCLE
WHITE SEA
GULF OF BOTHNIA
GULF OF FINLAND
GULF OF RIGA
BALTIC SEA
MOSCOW
LENINGRAD
ARCHANGEL
GORKI
KAZAN
TULA
HELSINKI
TALLINN
RIGA
VILNA
STOCKHOLM
TRONDHEIM
KONIGSBERG
WARSAW
DANZIG



Map of the railways of European Russia showing the double-line sections and newly-constructed links

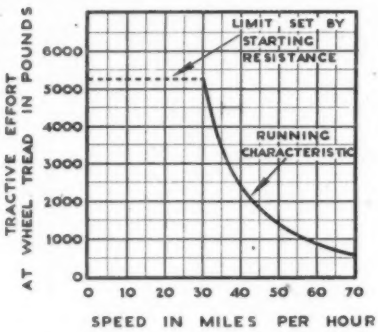
(*See article on page* 583)

Electric Railway Traction—V*

Current practice in electric train construction is described

By C. E. Fairburn, M.A., Acting Chief Mechanical Engineer & Electrical Engineer, L.M.S.R.

MOTORS for railway and tramway work are "series wound," that is to say, the same current passes through the field windings and the armature. It is obviously necessary, for mechanical reasons, to work a train from standstill to speed gradually and so, at starting, a resistance is placed in series with each set of motors to limit the current taken from the line. A proportion of the supply voltage is absorbed in this resistance and the remainder is impressed on the motors. Sections of the resistance are then cut out progressively by contactors, so as to reduce the voltage absorbed in the resistance and increase that applied to the motors. This speeds up the motors gradually and finally the resistance is completely cut out. The vehicle or locomotive then runs according to what is called the speed curve of its motors, an example of which for a series wound traction motor is shown in the diagram on this page. It will be seen that the tractive effort and speed are interdependent and if, for example, the vehicle is running up a gradient so demanding a high tractive effort, the speed will fall, whereas if it is running on the level, needing a smaller tractive effort, the speed will increase. This property of the series motor is very useful as it has the effect of limiting automatically the amount of energy that is drawn from the substations.



Tractive-effort-speed characteristic of a typical series-wound traction motor

It will be noticed that on electrified lines there is only a driver in the cab; he has no assistant as does the driver of a steam locomotive. This has been made possible by the introduction of what is known as the "dead man's handle." This is a device in which a button in the master controller handle or, in more modern cases, the handle itself, has to be held down by the driver against a spring. If, by any chance, this button or handle is not held down, it will automatically spring up and by so doing will cut off the power supply to the electric equipment and at the same time make an emergency application of the brakes; thus if a driver faints or is incapacitated in any way the train will be brought to a standstill automatically.

Trains consisting of motor cars and trailer cars are used mostly for suburban services; for longer-distance trains, where a higher standard of amenities such as dining cars, and so on, is required, locomotive traction has advantages and is usual for such trains abroad. Locomotives would have come into greater use in this country also had not the war interrupted the Manchester—Sheffield electrification. Locomotives are, of course, essential for freight working. It will be appreciated that the tractive effort demanded from a locomotive is far higher than that given by an individual motor-car and the controller has to provide a greater number of running speeds. Hence, on locomotives the equipment is of heavier construction and requires a greater number of contactors than on motor-cars, but apart from this there is little essential difference.

Standard stock with a minimum of alteration was originally used for suburban electrification schemes, but it is now realised that on this type of service every ton of material hauled costs about £10 a year in electric energy alone and so the present tendency is to try to lighten the stock. One of the most modern examples of lightened construction is the Liverpool—Southport stock which forms the subject of the accompanying illustration.

Most people will remember that on the London Underground there used to be an attendant at the end of each car to control the gate; later, each man operated two gates at the ends of two adjoining cars. Even this was obviously expensive in labour and made unloading rather slow; now there are sliding doors which can be operated from one point on the train. Actuation is by pistons operated by compressed air, the admission of which is controlled by electrically-operated valves. As a refinement of this there are now passenger operated doors; these are used at stations outside busy areas and tunnels, where the number of passengers is not large. With these the guard presses a button which releases the doors but does not open them, and the passenger himself presses a button on the door either inside or outside and the particular door will open. The idea is to cause as little disturbance as possible; it is appreciated by the public, particularly on cold nights, as only the necessary number of doors is opened.

Carriage heating, up to the present, has been rather a hit-and-miss matter as the heaters were switched on and off by the driver or guard to suit average conditions; sometimes compartments were too hot and sometimes too cold. The more

(*Continued on page* 587)

Light modern electric stock on the Liverpool—Southport line

* Abstract from a Faraday Lecture. Part I was published on August 20; Part II on September 17; Part III on October 15; and Part IV on November 12

New Rolling Stock for South Eastern Railway, Switzerland

This line, which was electrified just before the war, has adopted the latest equipment suggested by experience

THE South Eastern Railway of Switzerland is a standard-gauge line, operating a main route 38·5 km. (24 miles) long between Rapperswil and Arth-Goldau, with branches from Samstagern to Wädenswil and Bieberbrücke to Einsiedeln, bringing the total route-mileage to about 50 km. (31 miles).

The decision to abandon steam traction was taken in July, 1938, and electric working came into operation in the spring of 1939. The somewhat difficult operating conditions, with numerous sections as steep as 1 in 20, had led to electric traction being considered as early as 1926. In the meantime much experience had been gained on the connecting routes of the Federal and Bodensee-Toggenburg lines with the 15,000 V single-phase system, and accordingly this was adopted by the South Eastern management.

Foreign rolling stock was borrowed when conversion took place, as the holding of the National Exhibition, and later the outbreak of war, made it for some time impossible to obtain deliveries of new vehicles. Eventually a number was supplied, and the electrical equipments were divided among the three well-known concerns of Sécheron, Oerlikon, and Brown-Boveri. The motor coaches each weigh 50 *tonnes* in working order, with an hourly rating of 980 h.p. at 54 km.p.h. (33·5 m.p.h.). They are for third class passengers only, and have smoking and non-smoking compartments, each with central gangway, but no postal-service compartment, as originally intended. Regenerative braking is used, and has proved satisfactory. On a 1 in 20 gradient this is capable of braking a motor coach down to 11 km.p.h., and full control can be had when carrying a trailer load of 35 *tonnes*. It is estimated that about 1,000 units are recuperated daily—taking the 1942 winter service as a basis—and this gives a total yearly gain, allowing 10 per cent. for additional trains run at certain times, of 401,500 kWh, which at 5·5 ct. per unit represents fr. 22,500 To this must be added fr. 4,500 saving on brake-shoe wear. Up to June, 1943, the eight motor coaches had run about 2 million km. (1,242,744 miles).

It became necessary to modernise the ordinary trailer-stock, but the purchase of new vehicles offered great difficulties. The old 4-wheel coaches were not suitable for conversion, and some 6-wheel second-class vehicles, already rebuilt by the Federal Railways, were obtained from the latter system. These were reconstructed by the Swiss Wagon & Lift Works at Schlieren, near Zürich. It was not possible to use a great deal of the original materials, but the underframes, suitably lengthened, and a portion of the body framing, were utilised successfully. The underframes were extended by welding and stepped at the ends. A centre double-doorway was chosen, in preference to the end platform so frequently seen in Switzerland in the past, as giving better use of space with maximum convenience and comfort. The new bodies are of wood. The bogies are of a specially-light type, already furnished to the Federal Railways by the Schlieren Works, which have proved extremely smooth-running.

The tare weight of each converted coach is only 20 *tonnes;* but it offers seats for 80 and room for 20 standing, a good figure for vehicles able to run in any kind of service. It is intended to rebuild a further number of such coaches, in consequence of the favourable results obtained.

During last summer, the company put into service a small tractor or shunting locomotive, 4-wheels coupled, 400 h.p., generally similar to those used on the Federal lines, but with improved pantograph and other details. It was supplied by the Sécheron Works, and can be used for hauling light passenger-trains in case of need; it can reach a speed of 60 km.p.h. (37·25 m.p.h.).

The improvements made on the South Eastern system are typical of the progressive spirit animating the Swiss private railways, which has resulted in several remarkable designs of rolling stock, both for adhesion and rack-rail routes, being built during recent years.

Rectifiers for Regeneration

IT is mainly on steeply-graded d.c. railways that the grid-controlled inverted, or d.c.-a.c., operation of the mercury arc rectifier is utilised, and as this permits of regenerative braking the rectifier now is the equivalent of the rotary converter in either-way working, while still retaining the usual electrical and mechanical advantages.

Present practice generally is to instal side by side a rectifier and an inverter, which have no essential constructional differences, and in some examples the inverter is arranged for changing over automatically to a.c.-d.c. when the load is heavy, thus saving the rectifier from excessive or frequent overloading. If the inverter is used permanently as such, its electrodes must be kept hot by giving them a constant low basic load, for regeneration on mountain lines generally is intermittent, but there is a tendency for each of the twin units to be made capable or either-way operation.

The inverted operation of rectifiers is effected by grid control, and for this the d.c. busbar volts must be higher than the average d.c. voltage of the rectifier, and the grid control must be arranged to ignite the arc during the reverse polarity of the anodes. The rectifier current must flow from the anode to the cathode, and this is done by reversing the d.c. connections. The arc is transferred from one anode to the next by grid control, and the current, flowing through each anode in turn, corresponds to the phases of the transformer and induces a.c. in the secondary (normally the primary) of the transformer, and feeds power into the a.c. system. The practicability of inverted operation depends essentially on grid control to determine the sequence and timing of the arc on the various anodes. The regenerated voltage from the traction motors decreases with the speed, and it can be followed by altering the grid control. As a rule, the efficiency is somewhat less with inverted operation than with a.c.-d.c. conversion.

In the B.T.H. installations on the South African Railways the two units (a.c.-d.c. and d.c.-a.c.) are interchangeable in function, and all the equipments are suitable for the conversion of 90-kV three-phase current to 3,000 volts d.c. or *vice versa*. There is a common main transformer with separate secondary windings for a.c.-d.c. or d.c.-a.c. working. In this case the South African Electricity Supply Commission specified further that each equipment should be compounded when running either as a rectifier or as an inverter, so that practically constant busbar voltage could be maintained under all conditions of loading.

It is probable that in future a single equipment will become more common, and the necessary switchgear fitted to change the operation automatically as required, as a substation cannot normally be required to function simultaneously in the a.c.-d.c. and d.c.-a.c. directions. The function of the switchgear is to change the connection of the cathode from the positive busbar when operating as a rectifier to the negative busbar when operating as an inverter. The main objections to this solution at the moment are the total interruption of current and the excessive voltage rise at the moment the switches are being thrown over.

There are additional complications in certain installations. For instance, on the d.c. sections of the Italian State Railways there are substations fed by two independent three-phase 50-cycle supplies, and the contact line must be fed from either or both of these as desired, and must also feed back regenerated current to either system while being supplied from the other. High-speed circuit-breakers are used to limit the energy which can be transferred. These substations house three 2,000 kW. rectifier sets; one of these is a rectifier only, and the other two are capable of either-way operation.

Electric Railway Traction—V

(*Continued from page* 586)

recent method is to fit a thermostat in each compartment to switch the heaters "off" when the temperature reaches a certain value and "on" when it has fallen to another value, thus maintaining an even temperature.

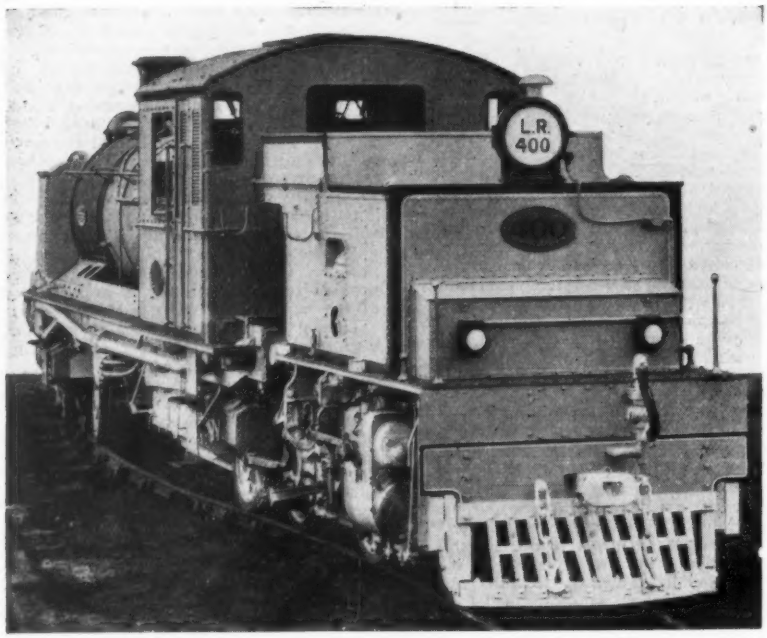
Although steam-hauled coaches are generally of the compartment type, for electric suburban trains many railways are now adopting what is called the saloon type of stock, similar to the Liverpool—Southport stock already mentioned. The idea of this is that it will make for quicker loading and unloading. On going to a compartment of the ordinary type and finding it full, a passenger is obliged to run up and down the platform until he finds a place; with the saloon type, however, he can get into the first door and find a seat after the train has started moving. The whole idea is to speed up schedules by limiting the duration of stops and to ensure greater safety by having the doors under the control of the guard.

This gives a general idea of developments in this country. To conclude, brief consideration will be given to what other countries are doing, particularly with electric locomotives.

(*To be continued*)

Special Design Beyer-Garratt Locomotives on the Leopoldina Railway (Metre-Gauge)

Designed for 30-metre curves, heavy grades, and low-grade fuel



WE are now able to publish some illustrations and particulars of a special type of Beyer-Garratt locomotive designed and built by Beyer, Peacock & Co. Ltd., ordered by the Leopoldina Railway at the outbreak of war, and which is now in service.

The Leopoldina Railway, which is the largest metre-gauge, and also the largest British-owned railway in Brazil, operates some 3,086 km. (1,917½ miles) of line, much of which traverses very difficult mountainous country. The Beyer-Garratt locomotives, of which four have been built, have been specially designed to the requirements of the Locomotive Superintendent, Mr. H. E. T. Vogel (now Chief Superintendent of Operations, Maintenance & Supplies), for the particularly arduous conditions and limiting factors existing on one of the branch lines known as the Cantagallo.

This branch, 77 km. (47¾ miles) in length, which terminates at Portella on the river Parahyba, elevation 44 metres (144 ft.), runs to Cordeiro at an elevation of 500 metres (1,640 ft.), from which point there is connection *via* the famous Friburgo Serra (1 in 11 adhesion) to the Port of Nictheroy on the Bay of Rio de Janeiro. Thus produce to the capital and exports from the hinterland of the State of Rio de Janeiro have to surmount this heavily-graded section.

The severity of the line is easily seen from the condensed profile illustrated; it has a ruling gradient of 1 in 30 (33 per mil) uncompensated, associated with curves as sharp as 30 metres radius (98 ft.). The illustration at the head of this article shows one of these locomotives on a curve of this radius. Conditions are further aggravated by the lightness of the permanent way, necessitating a maximum axleload of 8½ tons.

A further condition connected with the design of this locomotive was the necessity for providing a boiler of sufficient grate area and ashpan capacity to enable Brazilian coal of a calorific value of about 11,000 B.T.U's. to be burnt, on the one hand, and the high ash content, which from certain mines reaches 40 per cent., to be dealt with on the other. The sharp curvature prevents a locomotive with more than four wheels coupled being used, and before the advent of the locomotives under review, 0-4-2 tank locomotives were the principal type used; they hauled about 60 tons on the heaviest section.

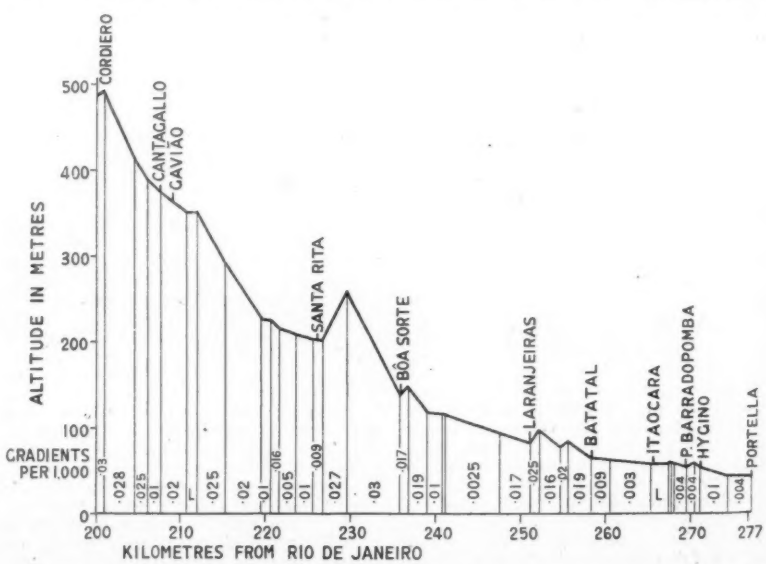
Locomotives of greater tractive effort were obviously required. The Garratt construction has enabled not only a double four-coupled locomotive to be provided with bogie wheels front and hind but has also permitted a boiler of specially large proportions for burning the Brazilian coal mentioned, and the necessary ashpan capacity. In this connection we would refer to our article in our February 23, 1940, issue which described a Pacific locomotive, built by Beyer, Peacock & Co. Ltd., which was specially re-designed to burn this fuel and has given complete satisfaction.

The illustrations included with this article give a clear idea of the general arrangement details of these engines, which as indicated are of the 2-4-2 + 2-4-2 wheel arrangement. The general particulars are as follow:—

Cylinders (4), dia.	11 in.
,, stroke	20 in.
Valves	O.C. poppet type
Coupled wheels, dia.	3 ft. 4 in.
Evaporative heating surface—	
Tubes	793 sq. ft.
Firebox (including 2 syphons)	128 sq. ft.
Total	921 sq. ft.
	182 sq. ft.
Combined total	1,103 sq. ft.
Grate area	30·3 sq. ft.
Boiler pressure	175 lb. per sq. in.
Coal capacity	2½ tons
Tractive effort—	
At 75 per cent. boiler pressure	15,880 lb.
At 85 per cent. boiler pressure	18,000 lb.
Weight of locomotive in working order	69 tons
Water capacity	1,700 gal.
Adhesive factor (75 per cent. boiler pressure)	4·88

The conditions of sharp curvature, limited axleload and low-grade fuel mentioned above were among the major problems confronting the designer in this locomotive. Among its special features are small rigid wheel base, the excellent boiler, rocking firebars, and self-cleaning ashpan, O.C. poppet valve gear, roller bearings on bogies and large cab.

The boiler, with Belpaire firebox, has a grate area of 30·3 sq. ft. and provides an interesting example of the possibilities in this respect despite the restrictions of the metre gauge. The steel firebox is



Condensed profile diagram showing gradients of the Cantagallo branch

fitted with two thermic syphons and Colville's Double Crown steel plates were used throughout. The water space stays, both rigid and flexible were supplied in best Yorkshire iron, and, as will be seen in the illustrations, ample provision is made for wash-out and inspection.

The barrel, which has an outside dia. of 4 ft. 8 in., is provided with 21 flue tubes of $5\frac{1}{4}$ in. dia. outside and 122 small tubes of $1\frac{3}{4}$ in. outside, all of Howell's Aquacidox brand steel.

A multiple-valve regulator is accommodated in the smokebox and the superheater elements are of the Melesco type. From experience gained on the Pacific locomotives mentioned above with various types of movable grates it was decided to incorporate rocking grates with both steam and hand operation, as giving the best results. The ashpan is unusually capacious to deal with the high ash content and is completely self-cleaning; it empties between the rails and has front and back dampers. The whole is remarkably accessible. The steam-operated fire door is of the Ajax pattern and a Melesco sand-gun is provided on the firebox back.

The boiler, firebox, and cylinders are lagged with Limpet brand asbestos mattresses. Two 3 in. Ross pop safety valves are located well clear of the weatherboard. The boiler is fed by two No. 8 Monitor lifting injectors by Nathan; these injectors are the standard pattern of the railway company. Feed water is introduced by a Gresham & Craven duplex-type combined feed-water heater with stop valve.

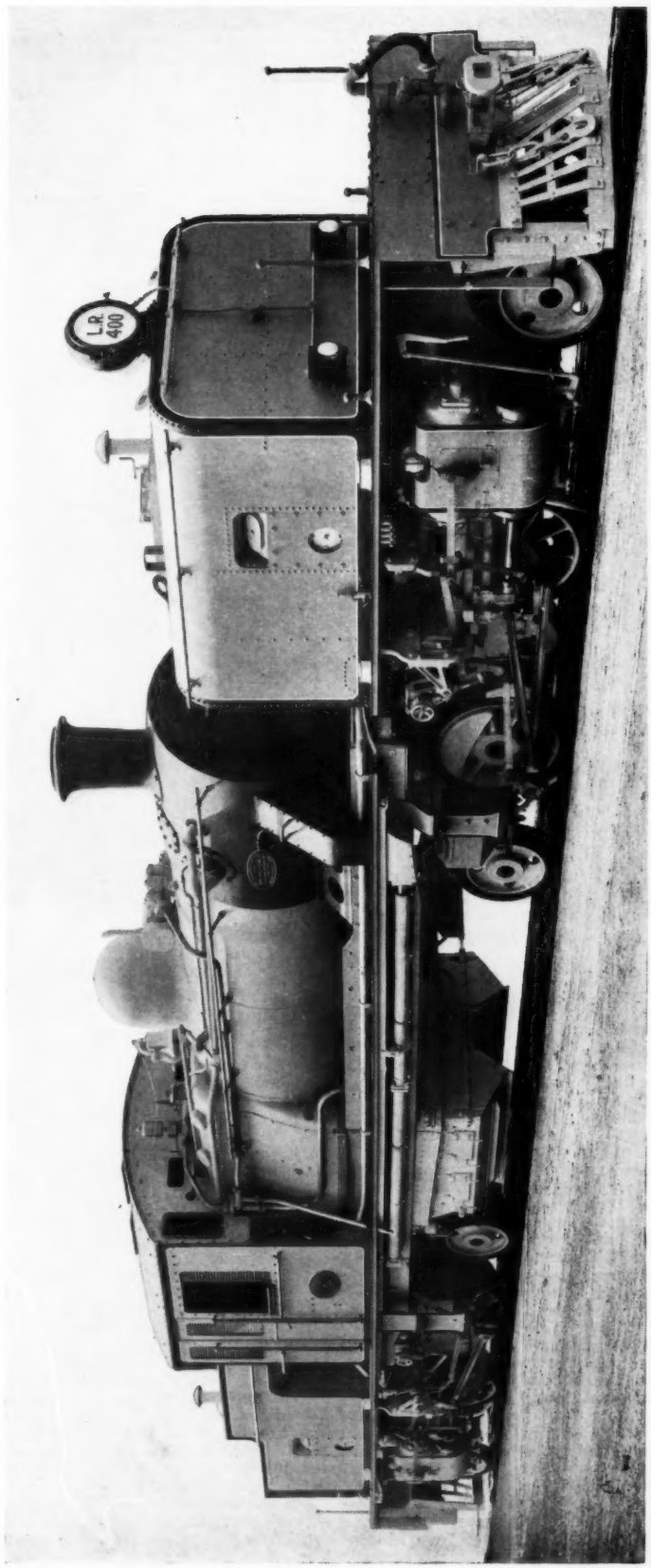
A 6 ft. rigid wheel base has been obtained between the coupled wheels, which are 3 ft. 4 in. dia., and the bogies, arranged with radial arms, are provided with the usual bogie check springs and are located to give the maximum clearance when negotiating curves. The bogie wheels, which are 2 ft. 6 in. dia., are of rolled steel, and provided with S.K.F. double row self-aligning roller bearings. The illustration of the locomotive on a double 30-metre curve gives some idea of the out of line movement of the units in relation to the boiler cradle, and of the particular problems encountered in providing for this exceptional side movement. In the case of the equalising pipe, a right-angle bend is provided between the frames, the elbow of which is supported on a flat surface plate; a metal shoe, projecting below the elbow, provides support with free movement in all directions. The cylinder cocks are operated by steam valves located in the cab, but provision is made on each unit for hand operation.

The location of details on the inner ends of the unit frames needed exceptional care to avoid fouling when on the sharp curves.

The coupled axleboxes are provided with bronze bearings with white metal inserts; the metals were of J. Stone & Co. Ltd. manufacture, as were those for the small end brasses and coupling-rod bushes. The springs are laminated, and the compensation is arranged in two groups.

Beyer Peacock's patent inverted pivot is included, with side roller bearers. Both the engine and boiler units are made up with plate frames of ample proportions, suitably braced to provide a chassis of maximum strength and at the same time allowing as much space as possible for accommodation of details between the frames.

The automatic vacuum brake is controlled by a Gresham & Craven ejector and a hand brake is provided on the hind engine unit. Dry sanding gear is pro-



General view of special Beyer-Garratt for the Leopoldina Railway (metre gauge)

vided to operate on each side of the coupled wheels and is actuated by servo-motors controlled from the cab.

The cylinders are of cast iron, designed for O.C. poppet valves, and are bolted through the frames with a substantial frame stretcher between them. They are provided with three drain cocks, arranged for steam operation controlled by a D-type sliding valve located on the firebox back. A hand lever is provided at the cylinders to operate the cocks when the steam supply is not available.

As shown in the illustrations, it has been possible to provide a particularly neat casting for the cylinder block. The piston heads are of the recess type and are fitted with two cast-iron rings and the piston rods are fitted with United Kingdom Metallic Packing.

The valve gear is of particular interest; this is of the latest oscillating cam O.C. poppet type supplied by the Associated Locomotive Equipment Limited, operated by Walschaerts motion.

Steam distribution is effected by four double-beat poppet valves, one governing admission and one exhaust. They are arranged horizontally at each end of the cylinder, providing maximum valve areas and, in conjunction with generous proportions of the cylinder ports and passages, reduce pressure drop to a minimum and ensure smooth steam flow with a free and unrestricted exhaust.

Cams impart movement to the valves through intermediate levers fitted with rollers; contact of the valves spindles with the levers is maintained by springs when steam is "off," and assisted by steam pressure when the regulator is open. The camshaft, mounted transversely and provided with separate inlet and exhaust cams, is oscillated by a valve connecting rod from the Walschaerts gear in the usual manner. Reversing and notching up is by means of the usual type of reversing screw; variation of cut-off is from 80 per cent. downwards, full valve openings being maintained throughout the greater part of the range.

The improved design of the poppet valves ensures steam tightness over long periods, and being of light-weight construction requires very small power for operation, reducing wear and tear of valve motion details. Accessibility is a feature of this gear and as the wearing parts are hardened it is claimed that they seldom require renewal; maintenance is confined generally to inspection and grinding-in of valves. The only parts of the poppet valve gear requiring lubrication are the valve spindles, which are supplied from a Wakefield No. 7 mechanical lubricator and an oil-box feed to the camshaft bearings. Carbonisation troubles are thereby reduced.

The crossheads are of the Laird type with cast-iron slippers with white-metal linings and brass side liners. A standard type of oil-box is fitted to the crossheads and felt pads are arranged at each end of the slippers.

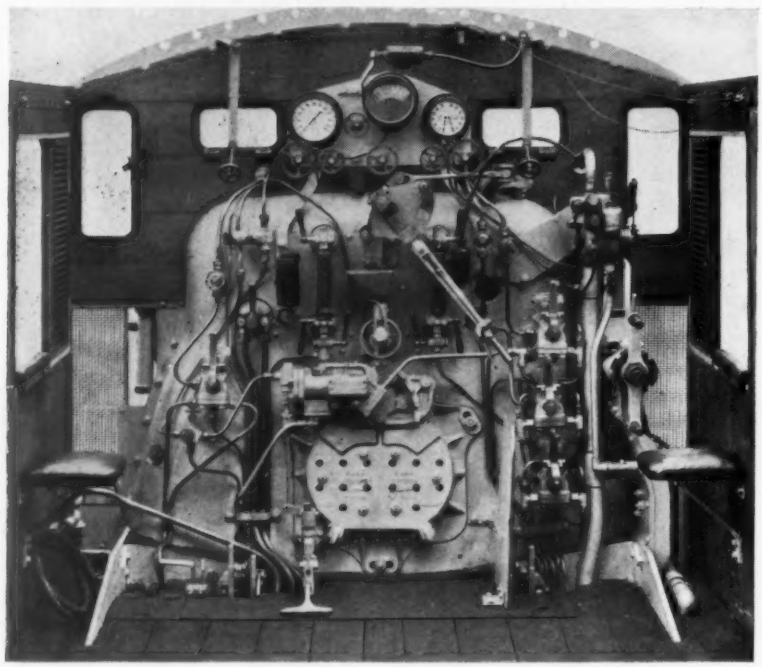
The roominess and accessibility of the cab can be seen from the illustrations and it is noteworthy for the gauge limits. Consideration has been given in the design to suiting the peculiar conditions which will be experienced when the engines are in service. Ample provision has been made for protection from bad weather, yet, at the same time, it is possible to open the cab and obtain good ventilation during hot weather. Further ventilation is provided by wire screens in the lower half of the weatherboard on both the fireman's and the driver's sides. Every care has been taken for the comfort of the engine crew; padded seats and arm rests are fitted, and the cab arrangement in general lends itself to cleanliness and the elimination of unnecessary effort by the crew.

The interior of the cab is fully lined with timber for insulation, and a wide ventilation hatch is provided in the roof. The regulator handle is provided with a lever latch and is of the railway company's standard pattern. Two Klinger Reflex water gauges are fitted to the back plate and in addition to the pressure and vacuum gauges a Foster electrical pyrometer is fitted in the centre of the panel. An Ajax steam-operated fire door adds to the arrangements for the benefit of the engine crew.

The sand gun, located on the firebox back, is of the Melesco pattern. Lubrication is effected by means of four 6-feed Wakefield No. 7 mechanical lubricators with the necessary check valves and anti-carbonisers. The feeds are arranged to supply the piston rods, cylinder barrels, cam shafts, steam valve spindles, exhaust valve spindles and the steam ball joint. Stone's electric lighting equipment with turbo-generator mounted on top of the boiler provides electric light for the head-light and cab light fittings.

An asbestos-packed Dewrance blow-off cock is fitted in the front of the firebox. The engine is provided with four 15-ton traversing screw jacks and two pairs of Stroudley ramps. The warning bell, mounted on top of the firebox, is in accordance with the railway company's regulations and the ample proportions of the whistle will be noticed.

These locomotives, which have been specially designed for the arduous work of the Cantagallo branch of this railway, should effect a considerable improvement in loads hauled and general performance. The locomotives have been built to the inspection of Livesey & Henderson, Consulting Engineers to this railway.



View of footplate showing arrangement and controls

PAPER FOR MAPS AND CHARTS.—The importance of paper salvage and economy in consumption is emphasised by the fact that, during naval operations, a warship carries between 1,500 and 2,000 maps and charts. In all, the Navy uses about 5,000,000 maps and charts in a year; those prepared for the invasion of Sicily alone weighed many tons. Among charts of special types are those for use in ships' lifeboats, which are printed on waterproof paper and wrapped in oilskin; but all types require high-grade paper and linen.

SYNTHETIC RUBBER FOR TYRES.—Colonel Eric Gore-Browne, D.S.O., Controller of Rubber, has stated that the rubber shortage is so acute in Great Britain that we shall be down to our minimum working stocks of the crude commodity by the end of this year. After that, we shall have to rely on our income of crude rubber, which has been reduced to about 10 per cent. of its pre-war figure, and on reclaimed scrap and synthetic products. American synthetics are promised for 1944 to help maintain the production of tyres on a war-time scale, but it is necessary for all tyre users to take the greatest care. The new tyres are likely to wear more rapidly. No tyres will be made entirely of synthetic rubber. The synthetics at present known have to be mixed with crude rubber to maker serviceable articles, and, although small tyres may require as little as 5 per cent. of crude, the larger sizes require as much as 60 per cent. The larger sizes are more in demand. There are about 50,000 tons of rubber tyres constantly being worn out on the roads of Britain, and the majority of them are fitted to commercial vehicles. Drivers are reminded that uneven tread-wear is to be corrected by changing tyres round—near-side with off-side, and back with front, and that all tyres should be submitted for replacement as soon as treads have worn smooth. At present, nearly 60 per cent. of the tyres returned for re-treading have to be rejected and sent to old tyre dumps.

RAILWAY NEWS SECTION

PERSONAL

The Rt. Hon. the Lord Hyndley is to retire from his position as Controller-General, Ministry of Fuel & Power. At the request of the Minister, Lord Hyndley is retaining his office until the end of the year, when he will be succeeded by Dr. H. S. Houldsworth.

Mr. Ivor Fraser, Principal Officer (Special Duties), London Passenger Transport Board, who, as recorded in our last week's issue, has retired from the Board's service, was born in 1883 and educated at Felsted. He joined H.M.S. *Worcester* as a cadet in 1898, and, after serving his apprenticeship and taking his Board of Trade certificates, was appointed Navigating Officer in the Eastern Telegraph Cable ships. From 1904 he was on the managerial staff of the *Morning Standard* and the *Evening Standard;* about 1912, at the invitation of Lord Ashfield, he joined the staff of the Underground companies to take charge of the Publicity and Commercial Advertising Departments under the late Mr. Frank Pick. On August 4, 1914, he was mobilised with the R.N.V.R., in which he was a Sub-Lieutenant (London Division). He saw service at Antwerp in 1914 with the Royal Naval Division, and in 1915, as Lt.-Commander, he joined the Royal Naval Armoured Cars in France. In the same year he took his pilot's certificate in the R.N.A.S., and in 1916 was gazetted Flight-Commander, R.N.A.S., in Command of Airship Anti-Submarine Patrols, Dardanelles. In 1917 he was promoted Wing-Commander, and commanded Airship Channel Patrols, Start Point-Cherbourg-Dungeness; on the merging of the R.N.A.S. with the R.F.C. he became Lt.-Colonel. In 1919 Mr. Fraser returned to the Underground companies, and remained in charge of publicity and commercial advertising until 1924. It was then that the Duke of Northumberland (the present Duke's father) invited him to become General Manager of the *Morning Post*. He resigned that position in 1935, because he was not in accord with the newspaper's policy. Lord Ashfield then invited Mr. Fraser to return to the L.P.T.B. to assist in the development of publicity, for which purpose he was attached to the Chairman's Office, and worked with the late Mr. Frank Pick. Afterwards the latter was appointed Director-General, Ministry of Information, and Mr. Fraser became Controller, Home Division, at the Ministry. Later Mr. Fraser returned to the L.P.T.B. as Chief Commercial Manager in the absence of Mr. R. McDonald, who had been seconded to the Air Ministry. For the last 2½ years he has presided over the Commercial Department of the Board.

We regret to record the death, at the age of 73, of Mr. A. W. Air, who was, up to the time of his retirement three years ago, Lord Plender's personal assistant on the Great Western Railway and other audits. His experience of railway accounting and finance was unique, and during his fifty years of service with the firm of Deloitte, Plender, Griffiths & Company he assisted Lord Plender in connection with many important phases of railway financial history. Mr. Air also was for many years in charge of a number of audits for commercial companies; his experience covered several arbitrations and numerous investigations both at home and abroad. His knowledge and experience of railway accountancy, together with his sound judgment, was always unreservedly at the disposal of those with whom he was associated. He was held by his many friends in the railway world in affection and esteem.

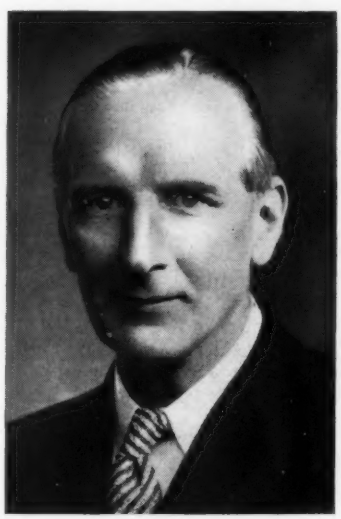
Mr. George William Eggleshaw, Stationmaster, Marylebone, L.N.E.R., retired on October 22, after 44 years' service. He entered the service of the former G.C.R. as a goods clerk at Sheepbridge & Brimington in 1899, and spent the earlier years of his railway career at Worksop, Sheffield, Leicester, Immingham, Chesterfield, Grimsby, and Boston. In 1925 he became Chief Clerk in the Stationmaster's Office at Marylebone. In December, 1931, Mr. Eggleshaw went for a period of 18 months to the District Superintendent's Office at Kings Cross, before returning, as Stationmaster, to Marylebone in June, 1932.

L.M.S.R. Appointments

The L.M.S.R. announces that Mr. C. N. Mansfield has been appointed Mineral Manager & Principal Assistant to the Chief Commercial Manager.

Mr. S. J. Marchant, Assistant to Chief Officer for Labour & Establishment (Wages), has been appointed Principal Assistant to Chief Officer for Labour & Establishment.

Mr. B. H. Harbour, Secretary to the Chairman, London Passenger Transport Board, who, as recorded in our last week's issue, has been appointed Commercial Manager, with responsibility for public relations, publicity, fares and charges, traffic development and schedules, and commercial advertising, entered the Accountant's Department of the Metropolitan Railway in 1913. After experience in many departments, he was appointed in 1927 to the Statistical Office of the Underground group of companies, and in 1928 to the Office of the Secretary & Treasurer of the group. From 1930 to 1933 he was attached to the office of the Chairman of the companies for special duties with Sir Ernest Clark, a Director. On the formation of the L.P.T.B., he was transferred to the Actuary's Office, and early in 1935 he became Assistant to the Actuary, with responsibility for the financial, economic, and statistical functions of that office. In 1937 he was made Secretary to the Chairman, and in January, 1939, was appointed Secretary to the Standing Joint Committee of the Board and the four main-line railway companies. During the early part of the war he acted also as assistant to the former Vice-Chairman (Mr. Frank Pick). Mr. Harbour was appointed an officer of the Board in May, 1940.



Mr. Ivor Fraser

Who has acted as Chief Commercial Manager, L.P.T.B., 1941-43, and has retired

The late Mr. A. W. Air

For many years Principal Railway Assistant, Deloitte, Plender, Griffiths & Company

Mr. B. H. Harbour

Appointed Commercial Manager, L.P.T.B.

Sir Felix Pole, Chairman of Associated Electrical Industries Limited, has been appointed a Director of the Tilbury Contracting & Dredging Co. Ltd.

Mr. B. L. Curran, Accountant, County Donegal Railways Joint Committee, has been appointed Manager, in succession to the late Mr. Henry Forbes.

We regret to record the death on November 22 of Mr. C. V. Loverock, Joint Managing Director in South Africa of Cable & Wireless of South Africa Limited.

Lt.-Colonel W. L. Topham, Royal Engineers, who was formerly with the Buenos Ayres Great Southern Railway, is now acting as Assistant Chief Mechanical Engineer, Egyptian State Railways.

Mr. J. S. Wills has been appointed Chairman, and Mr. W. T. James a Director, of the North Western Road Car Co. Ltd., a member of the group of bus companies associated with the British Electric Traction Co. Ltd.

We regret to record the death on November 20, at the age of 77, of Colonel Robert Edward Pemberton Pigott, C.I.E., who was Chief Electrical Engineer, Bombay, Baroda & Central India Railway, from 1908 to 1922.

Sir E. Julian Foley has been appointed General Liaison Officer to the East African Governments. He retired at the end of October, 1942, from the position of Deputy Director - General (Shipping—Group 1), Ministry of War Transport.

We regret to record the death, on December 7, at the age of 87, of Mr. John G. Robinson, C.B.E., Chief Mechanical Engineer of the Great Central Railway from 1902 to 1923.

We regret to record the death on November 25, at the age of 90, of Colonel Willoughby Verner Constable, late R.E., who had been Chairman of the Madras & Southern Mahratta Railway Company from 1916 until December 31, 1934. On his retirement from the Chairmanship he retained his seat on the Board until his resignation on December 31, 1937. He was also for many years Deputy-Chairman of the Bombay, Baroda & Central India Railway Company until its operation was taken over by the Government of India as from January 1, 1942.

Institute of Transport

Among those elected recently to membership of the Institute of Transport are Messrs. J. A. Clarke, Secretary & Chief Accountant, Northern Ireland Road Transport Board; J. B. Dunkley, District Passenger Manager, Birmingham, L.M.S.R.; and J. W. Hutton, Secretary, Northern Counties Committee, L.M.S.R. Those elected to associate membership include Messrs. T. B. Andison, Secretary & Accountant, Belfast & County Down Railway; J. F. Atkinson, Assistant to Traffic Manager (Commercial Indoor), G.N.R. (I.); A. M. Beaton, Assistant to Traffic Manager (Commercial Outdoor), G.N.R. (I.); S. J. Bennett, Federation of British Industries; E. J. Borron, Traffic Superintendent, Nyasaland, Central Africa, and Trans-Zambesia Railways; J. B. Chevallier, District Manager (Portsmouth), Southdown Motor Services Limited; R. W. Ellson, Stationmaster, Kettering, L.M.S.R.; H. Evans, Assistant to Traffic Manager (Operating), G.N.R. (I.); and F. B. Taylor, Southern Railway. Mr. E. H. Short, General Secretary, British Railway Stockholders Union Limited, has been elected to associateship of the Institute.

Mr. R. Paterson, Assistant District Goods Manager, Birmingham, L.M.S.R., who, as recorded in our November 19 issue, has been appointed District Goods Manager, Bolton, entered the service of the former L.N.W.R. in 1911 as an apprentice, and received training in the Goods, Passenger, and Traffic Departments. He joined the Armed Forces in 1914, and returned to the L.N.W.R. in 1919, and continued his training. He was appointed a year later to the Chief Goods Manager's Office, where he was engaged in the Accommodation & New Works and Development Sections until 1932. Two years afterwards he was made Assistant to the District Goods & Passenger Manager, Derby. Mr. Paterson was appointed Goods Agent, Nottingham, in 1937; Assistant District Goods & Passenger Manager, Northampton, in 1938; Goods Agent, St. Pancras & Somers Town, in 1941; and Assistant District Goods Manager, Birmingham, in 1942.

Mr. R. Paterson
Appointed District Goods Manager, Bolton, L.M.S.R.

Mr. A. G. E. Briggs, Special Director & Sales Manager, and Mr. H. H. Burton, Special Director & Chief Metallurgist, English Steel Corporation Limited, have been appointed Directors of the corporation. Mr. Briggs is Deputy-Controller of Iron & Steel Supplies, Ministry of Supply.

Indian Railway Staff Changes

Mr. P. S. Clarke has been appointed to officiate as Traffic Superintendent, B.B.C.I.R.

Mr. B. C. Chatterjee has been appointed to officiate as Deputy Chief Mechanical Engineer, E.I.R.

The services of Mr. K. C. Srinivasan, Deputy Chief Accounts Officer, G.I.P.R., have been lent to the War Department.

Mr. C. T. Venugopal has been appointed to officiate as Deputy Chief Accounts Officer, G.I.P.R.

Mr. R. C. Ivey, Officiating Chief Transportation Superintendent, G.I.P.R., has been granted 19 months' leave preparatory to retirement.

Mr. Leonard Moritz has been appointed a Director of British Timken Limited. He has been a Director of Fischer Bearings Co. Ltd. for some years, and, since British Timken Limited acquired control, has been Works Director.

Mr. P. H. Wilson, O.B.E., M.I.Mech.E., Assistant Managing Director (Technical) of the Stanton Ironworks Co. Ltd., has been appointed Deputy Managing Director, as from December 1 last.

Mr. W. A. Murray, Signal Engineer, O.T.R., has been invalided from the service.

We regret to record the death on December 4, after a short illness, of Mr. Cyril George Stileman, Deputy Civil Engineer-in-Chief to the Admiralty, and of Sir Alexander Gibb & Partners.

President Roosevelt greeting Lord Leathers, the British Minister of War Transport, at the recent three-power conference in North Africa

TRANSPORT SERVICES AND THE WAR—219

Heavy War Traffics

By intensive operating, extremely heavy traffics are being handled on the British railways, and many lines are densely occupied with both passenger and freight trains, but it is only occasionally that any statistical indication of volume is given. Last week the Railway Executive Committee announced that a recent survey showed, over the busiest stretch of double line track, 284 trains being run in a period of 24 hours. The trains were :—

	Down line	Up line	Totals
Passenger trains	60	60	120
Goods trains	60	84	144
Parcels trains	6	6	12
Empty coaching-stock trains	3	—	3
Light engines and engines & brake vans	2	3	5
	131	153	284

The number of wagons conveyed by the 60 goods trains on the down line totalled 3,000, and the number of wagons conveyed by the 84 goods trains amounted to 4,200—an aggregate of 7,200 wagons. (*See also editorial note, page* 573).

Air Attacks on Railway Targets

The weather during most of the first ten nights of November was poor or bad by reason of a continuation of the low cloud and fog which had been such a marked feature of the end of October. Conditions then improved somewhat but were still very changeable. During November, Bomber Command made 4 major, 3 moderate, and 1 medium-sized attacks on Germany on 8 nights, and on 2 others one moderate and another medium-scale operation were carried out against railway objectives in occupied territory. Small-scale Mosquito raids on targets in Germany were also made on 8 of these nights and on 14 other nights. Thus night bombers operated on 24 nights, dropping 13,000 tons on Germany and a further 1,500 on occupied territory. The four large-scale operations took place on November 3/4 against Dusseldorf, with Cologne as a subsidiary target ; on 18/19, a two-pronged attack against Berlin and Ludwigshafen ; on 22/23 against Berlin ; and on 26/27 again on Berlin, with Stuttgart as a secondary objective. An average of well over 2,000 tons was dropped on each of these nights. Moderate-sized operations were carried out against Leverkusen on 19/20 ; Berlin on 23/24 and Frankfort-on-Main on 25/26 in Germany, and on Modane on 10/11, and medium-scale operations on Ludwigshafen on 17/18 in Germany, and Cannes and other railway targets on 11/12 in France. Some 4,500 tons were dropped in these attacks. The Mosquito attacks ranged over a variety of targets in western and north-western Germany, and there were 5 minor raids on the German capital.

Medium, light, and fighter-bombers were active in daylight both in association with attacks of the U.S. Army Air Force and in independent missions. Bombing was carried out on 21 days ; airfields were bombed on 6 days, railway targets on 9, and industrial and miscellaneous objectives on 16 other days. Fighter attacks were also made on trains on 16 days. Intruder operations and offensive patrols were carried out on 25 nights. Bombing attacks were made on airfields on 14 nights, on railway targets on 9 nights, and on industrial and other objectives on 2 other nights.

Christmas Travel

In addition to the Christmas leave restrictions on Civil Servants and Army personnel which we recorded last week, the following steps to prevent increases of unnecessary passenger travel at Christmas were announced in the House of Commons (*see also p.* 597) on December 1 :—

Arrangements for granting free or assisted travel to civilians, including transferred Civil Defence workers, and relatives visiting evacuees, will be suspended.

The few remaining restaurant cars will be withdrawn from December 22 until December 28.

The American Army authorities have agreed to restrict the leave of American soldiers in this country so as to correspond generally with the British restrictions.

To make it easier for women workers in the L.N.E.R. Temple Mills wagon shops to handle heavy axle boxes, an adjustable lever device has been introduced, as shown in this illustration. The lever is attached to the wagon side and enables women to lift heavy loads with minimum effort. It can be swung round into the wagon to place the load in the right position. Both the lever and also the special 2-wheel barrow with "horns" (also shown) that enables axle boxes to be picked up and transported without lifting, have been improvised locally from scrap material

Joint G.P.O. and railway poster to which reference is made below

Joint Railway and G.P.O. Poster

Some 5,000 sites on railway stations throughout the country are being used by the G.P.O. for its new poster by Austin Cooper (reproduced above), which states "Telegraph less, Telephone less—says the Post Office ; and Travel less, say the Railways." The linking of the messages, and the appearance of these posters on stations, as well as in post offices, is by G.P.O. arrangement made with the railway companies. The Ministry of Information is distributing the posters. Travel by rail and communication by telephone or telegraph are often regarded as alternatives, and it is not desired that propaganda against one should result in increased use of another.

German Tramcar Standardisation

We have often pointed out in these columns that tramways still retain considerable favour in Germany, and much thought is bestowed on their development. It may be recalled that a special committee reported on the question of arriving at standard designs for tramcars and their equipment, with the object of cheapening and facilitating production and enabling all manufacturers to participate in a fair share of the supply work, at regulated prices applicable throughout the industry. We recorded in our issue of December 19 & 26, 1941 (page 675), that three standard designs of motor coach for the standard gauge and corresponding ones for the metre gauge, with suitable trailers, had been adopted. The 600-volt d.c. system, with pantograph collectors, has been accepted for all lines. The designs for the various powered motors have been agreed on in sufficient detail and are interchangeable as between different makers.

The controller and auxiliary details have not yet been standardised so completely, however, as there are certain practical difficulties at present. Electric dynamic and track braking, with solenoid equipment on trailers, has been selected in preference to using compressed air, and may

be combined with regenerative equipment where the circumstances are favourable. It is intended to raise the average speed on many routes. The standard "off" position for all controller handles is to be 45 deg. to the left of the centre fore-and-aft line as seen by the driver, with the handle moving clockwise to apply power. There are to be 18 power and 15 braking positions in all cases.

Head, tail, and other signal lights are to be fed from a 12-volt nickel-iron accumulator battery, and a brake warning signal light is also to be provided. The signal to start or stop is also to be given by luminous indicators. The cars will have power-operated doors, speed indicators, and other refinements. Blackout fittings have been standardised. It is stated by the German authorities that tramway undertakings should be able to modernise their systems with the minimum of expense now that the disadvantages of so many different designs of car have been largely eliminated.

New Railways in Croatia

Railway construction in Croatia, in addition to the lines enumerated in our issue of April 30, 1943 (page 435), is stated to comprise a 39-mile standard-gauge railway between Okucani (on the Zagreb-Belgrade main line, 12½ miles east of Novska and Banja Luka). Preliminary work was begun early in June with the bridge which will carry the line across the River Sava near Bosanska Gradiška, 9 miles south of Okucani.

The Metkovic-Ploce extension of the Gabela-Metkovic branch is nearly complete, and the following stations have been established (the distances are from Metkovic): Kula Norinska 3 miles, Opuzen 6 miles, Komin 7½ miles, Rogotin 11 miles, and Ploce 14 miles.

In connection with the double tracking of the Zagreb-Sutla main line, reported in our April 30 issue, an underbridge at Zagreb, carrying the line across the Sava ulica (Sava Street) is being doubled. The doubling of this line beyond Sutla as far as Zidani Most (a 32-miles section in German-occupied territory) is said to be in hand. Savski Marof, the frontier station on the Croat side, has been reconstructed.

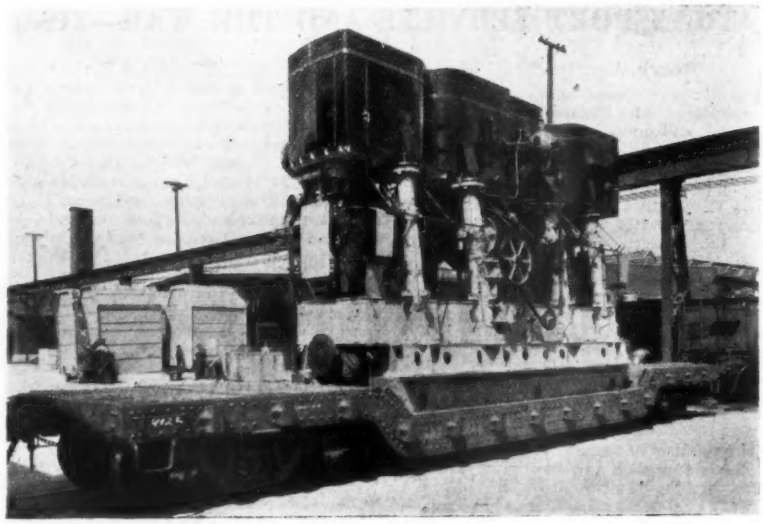
On the other line leading to what is now German-occupied territory, namely, that from Zapresic (10 miles west of Zagreb), a bridge has been reconstructed near Krapina, 35 miles from Zagreb and 3 miles from Djurmanec, the Croat frontier station.

At the Zagreb marshalling yard of Zagreb-Sajmiste, 2 miles from Zagreb Central Station on the main line to Botovo and Gyekenyes (Hungary), four new sidings have been established. This is in addition to the extension at Vrapce, already reported.

Work on Mexican Highways

Construction has been intensified on the section of the 110-mile highway that will connect Oaxaca City, capital of Oaxaca State (Mexico), with Puerto Angel, a vital port on the Pacific coast, to such an extent that the government and military authorities of that State are expecting the President of the Republic to declare it inaugurated provisionally for traffic. This work is another demonstration of highway undertakings that are being performed by the co-operation of the Federal and State Governments of Mexico. In addition, the second section of the Pan-American Highway, namely, that between Mexico City and Oaxaca City, is now built. The paving has made considerable progress, and the finished road already extends to south of the city of Huajuapan de Leon.

A National Highways Commission report says that work on the old Antequera road to the Isthmus of Tehuantepec has so far advanced that grading has almost been completed to the sierra (mountain region), in which section, the heaviest and most expensive to build, the Commission is supervising the opening of a branch that has been built for several kilometres. These works are being undertaken by the Compañia Constructora Mexico.



C.P.R.-built 70-ton main marine engine loaded on a depressed-centre flat wagon at the Angus Shops, Montreal, ready for shipment to Quebec

International Transport Contracts

The June issue of the *Bulletin des Transports International par Chemins de fer*, which is published in Berne, Switzerland, contains an article by a high pre-surrender officer of the Italian State Railways dealing with the suspension in wartime of international transport contracts, and resultant actions for specific performance or payment of damages. The point is discussed as to whether the articles of the Berne Convention are abolished by war conditions or only suspended. The question at issue is naturally that of the performance of contracts entered into before the war. In practice, there can be little doubt that all international treaties between belligerents will be regarded as abolished, and subsequent commercial relationships will be regulated by the terms of the peace treaties.

C.P.R. Builds Marine Engines

Large main marine engines and condensers, to meet the urgent need of the Royal Canadian Navy escort services, are coming off the production lines of the Canadian Pacific Railway Angus Shops, Montreal, in a steadily increasing flow. They are being made in a section of the shops which was released from the manufacture of Valentine tanks in May of this year, when the list of orders for more than 1,400 of these tanks, mainly for service in Russia, was completed on schedule. Since then, tank work has been confined to the provision of spare parts.

Security regulations now permit the release of the information that the first of the 70-ton main marine engines was delivered to the Morton Engineering & Dry Dock Company in Quebec City on August 21, a remarkably short time after laying down the first 10-ton engine bedplate on May 30. The first condenser, weighing 8½ tons, went to Mortons on July 30, only a little more than two months after the completion of the last tank built on the Valentine tank contract at Angus shops on May 15.

As was the case with the tanks, the marine engines are being made at the same time as the Angus Shops handle the greatly increased repairs required by locomotives and wagons because of the company's heavier transport load. All the jobs are carried on with no new buildings or extensive additions to the existing plant, demonstrating the versatility of the department headed by Mr. H. B. Bowen, Chief of Motive Power & Rolling Stock.

The Canadian Pacific Railway began the first marine engine contract on advice from the Department of Munitions & Supply that there was a "very urgent need of marine engines and condensers to balance the production of hulls at the various shipyards," and as a report on the subject states, "the very best efforts were put forth by all persons responsible for this work, including the actual workmen." Authorisation to build 10 sets of main marine engines and condensers for single-screw vessels was received on October 31 of last year. In less than a month complete production drawings had been made, material ordered, and the first forgings had reached the Angus Shops. Machining of parts and fabrication of sub-assemblies were begun while the tank work was still proceeding. As machine capacity and floor space were released from the tank contract, they were used for the marine engine work. Production lines have so developed that an output rate of six main engines a month will be reached by the end of this November, and six have been already delivered, as well as ten condensers, well up to requirements of the Department of Munitions & Supply, while the shops have surplus capacity to produce welded steels bedplates for these main engines, and are soon to be producing twin-screw units.

The accompanying picture shows one of the marine engines loaded for shipment on a Canadian Pacific Railway depressed-centre flat car at the Angus Shops. The loading instructions for these vehicles require the maximum load to be distributed over a minimum of 15 ft. These engines are out-of-gauge loads, which require special handling to pass permanent installations such as bridges, and advice on their movement has to be given by the company's engineering department.

Railway Meetings

Buenos Ayres Western Railway Limited

The annual general meeting of the Buenos Ayres Western Railway Limited was held on December 8 at the offices of the company, River Plate House, Finsbury Circus, London, E.C.2.

Below are extracts from the statement by the Deputy Chairman, the Rt. Hon. Viscount Davidson, P.C., G.C.V.O., circulated with the report and accounts:—

In pursuance of the policy of increasing the collaboration between the four broad-gauge lines, Mr. Eddy, accompanied by Lord Forres and Mr. Drayton, is at present in Buenos Aires, engaged on the examination on the spot of measures for closer working of the four railways. The Argentine Government has appointed a committee, of which the above directors are members, to recommend measures for the solution of the railways' problems.

Total revenue was higher than in any year since 1930, and it is unfortunate that such satisfactory earnings should have been accompanied by an increase in working expenses which more than offset any benefit to be derived therefrom. By far the larger part of these increased expenses are directly or indirectly due to a factor over which we have no control —the use of wood (or other inferior substitutes) as fuel.

Tribute to Engineers and Staff

The difficulties with which the company's staff—especially those responsible for the maintenance of track, locomotives, and rolling stock—have been faced are increasing, and one can hardly overrate the debt which the company and the Argentine public owe to the achievements of the British and Argentine engineers and staff generally, which have resulted in a remarkably high standard of service and efficiency in circumstances of almost unparalleled difficulty.

During the year the secretary of the company, who had not visited the Argentine recently, spent some months in that country, and has been able to furnish the board with very useful information after discussions and contacts on the spot with the officials of the company.

On June 4 last the Government of Dr. Castillo was replaced by a military Government headed by General Arturo Rawson, who, three days later, gave way to General Pedro P. Ramirez, the Minister of War in the Castillo Government.

Because of the cessation of fuel imports the Government has interested itself in the mineral deposits in the Andine district, the development of which hitherto has been handicapped by lack of transport facilities. The Government has instructed the State Railways to connect the northern part of the district by rail to the Pacific Railway at Pedro Vargas Station. Although we would have naturally preferred this line to be brought to our station at Soitue, both this company and the Southern are co-operating by the supply of track materials, and we are hoping for at least indirect benefits from the opening up of this new district.

Favourable Trade Balance

Because of Allied meat purchases and the Government subsidy to corn-growers, internal conditions in the country continue good, and the severe curtailment of imports has enabled Argentina to show a substantial trade balance, in her favour. The present Government has reversed the policy of its predecessor and has encouraged the agricultural community to increase the acreage under cultivation. It is estimated that the sowings, although much below pre-war acreage, will be 25 per cent. greater than last year. The prospects of the harvest to date are very much better than last year.

Buenos Ayres Great Southern Railway Co. Ltd.

The annual general meeting of the Buenos Ayres Great Southern Railway Co. Ltd. was held on December 8 at the offices of the company, River Plate House, Finsbury Circus, London, E.C.2.

Below are extracts from the statement by the Deputy Chairman, the Rt. Hon. Viscount Davidson, P.C., G.C.V.O., circulated with the report and accounts:—

In pursuance of the policy of increasing the collaboration between the four broad-gauge lines, Mr. Eddy, accompanied by Lord Forres and Mr. Drayton, is at present in Buenos Aires, engaged on the examination on the spot of measures for closer working of the four railways. They represent the London boards jointly. A communication has been received from them indicating that in their opinion their visit is opportune and that they have every hope that it will prove fruitful.

Two Outstanding Matters

The two outstanding matters during the past year have been the scarcity and ever-increasing cost of fuel, and the negotiations with the Government for tariff increases. In 1939 we burnt, roughly, 25,000 tons of oil and 12,400 tons of coal a month. Today supplies of coal are negligible, and our monthly allowance of fuel oil is only 11,250 tons. For practically all the rest of our fuel requirements we have to rely on poor and very expensive wood. It takes over three tons of this wood to do the work of one ton of coal, with the result that at times as many as 2,000 wagons have to be used for carrying wood for the railway to the detriment of our general traffic.

On June 4 last the Government of Dr. Castillo was replaced by a military Government headed by General Arturo Rawson, who, three days later, gave way to General Pedro P. Ramirez, the Minister of War in the Castillo Government. Negotiations with the late Government for tariff increases had very limited results. I am glad to inform you that the present Argentine Government has appointed a committee, of which Mr. Eddy, Lord Forres, and Mr. Drayton are by decree members, to recommend to the executive power measures for the solution of the railways' problems. We understand that the committee is sitting, and we hope that its labours may be crowned with success.

Ingenuity of the Staff

Everything that I saw myself last year and that the secretary who has visited the Argentine this year has told me, confirms the chairman's report that the continuous efforts of the company's staff to keep the wheels turning in the face of so many wartime difficulties are worthy of the highest praise. The ingenuity which our employees are showing in improvising both methods and material is remarkable. Nevertheless, supplies of certain essential spares, such as locomotive tyres, are running dangerously short, and we are hoping that our representations to the U.S.A. for a small allotment of such articles may be favourably considered.

Road competition has not appreciably decreased, in spite of the growing shortage of tyres and spare parts. We have had to protect our interests as best we can, pending some adequate steps being taken to co-ordinate the transport of the country. The small diesel railcars which were purchased shortly before the war have been invaluable in the present crisis. The amount of diesel oil required by them has been forthcoming, and both they and the heavier diesel vehicles purchased previously have been able to supplement our greatly curtailed steam service.

The present Government has reversed the policy of its predecessor and has encouraged the agricultural community to increase the acreage under cultivation, and it is estimated that the sowings, although much below pre-war acreage, will be 14 per cent. greater than last year. The prospects to date are good.

Bohumin-Kosice Railway. — Legal sanction was given some time ago to the nationalisation of the Bohumin-Kosice Railway (otherwise known as the Kaschau-Oderberger Bahn) which crosses northern Slovakia from Cadca in the north-west, *via* Zilina and Vrutky, to Kostolany and Horn, the frontier station 5½ miles to the north of Kosice. The railway was actually taken over by the Slovak State Railways in 1941 in accordance with an agreement between the company on the one hand and Slovakia, Hungary, and Germany on the other, concluded on November 15, 1940, and of which we published particulars in our issue of November 14, 1941. The quota of the company's liabilities for which Slovakia became responsible is now stated to be divided into three groups: (*a*) liabilities which occur once only, and the amount of which is fixed; (*b*) liabilities recurring every year; and (*c*) liabilities occurring once only, but the extent of which is not known. Liabilities of the first group total Slov. Kronen 146,000,000, half of which has already been paid; those of the second group amount to about Kronen 65,000,000 per annum; and those of the third group are said to be of minor importance.

New Hungarian Road Bridge.—A new road bridge, 196 ft. 9 in. long, spanning the River Berettyo, was opened to traffic recently. The bridge is near Paptamasi railway station, 13 miles to the north of Nagyvarad.

Institute of Transport Luncheon

Brigadier C. F. Napier on transport requirements for an overseas expedition

At a luncheon held by the Institute of Transport at the Connaught Rooms, London, W.C.2, on December 3, Brigadier C. F. Napier, O.B.E., Deputy Director of Movements, was the speaker. At short notice he took the place of General Sir Thomas Riddell-Webster, K.C.B., D.S.O., Quartermaster General to the Forces, who was unable to be present. Sir William Wood, President of the Institute, was in the chair.

Sir William Wood, President, introducing Brigadier Napier, said that he went to the War Office before the war on the reorganisation arrangements for Movements, and he had played his part in the evacuation of Dunkirk. Since then he had been arranging the largest movements the Army had had in its history. We had every right to be proud of the Army organisation in this country. Brigadier Napier was already a member of the Institute of Transport. He had become a graduate many years ago.

Brigadier Napier said he had selected as his topic the mounting of an overseas expedition from this country, because it touched on all branches of transport. The largest movement out of this country had been in connection with the North African expedition; that was just about a year ago. The first convoy sailed on October 22 last year, and before the assault on November 8, 26 convoys sailed. Within three weeks 250 personnel and cargo ships sailed.

He went on to explain the steps which led up to the mounting of an overseas offensive, and explained the machinery which existed for collaboration between the Force Staff, comprising those in charge of the actual military operations, and the Departmental Staff, those who had to plan the movement of the Forces. There were daily consultations between these two staffs. Provision of shipping was the responsibility of the Ministry of War Transport, and in particular of the Directorate of Sea Transport in that Ministry. The first necessity for planning was a clear statement of the shipping available, and the second was to outline a convoy programme. The Admiralty provided the escorts, the Ministry of War Transport provided the ships, and the Forces provided the troops, vehicles, and stores. Once a clear programme had been established it was possible for the Forces to decide the exact allocation of units and stores, and so forth, and the manner in which they were to be loaded.

One of the problems which had to be faced was that not only were the ships available of all sizes and types, but so also were the stores, and it was necessary to arrange the loading of the ships so that disembarkation was in the order desired for an efficient campaign. Moreover, it was impossible to decide with accuracy what ships would be available at a given time for an operation.

From the time the convoy programme was drawn up to the time the first ship sailed, it was necessary to allow for a lapse of at least two months. One month was occupied in working out the requirements and presenting it in the form of tables showing the desired allocation and order of discharge of troops, stores, etc. During the second month, the first week was given over to working out the stowage of the expedition. Then movement instructions had to be issued, to get the military vehicles from their depots all over the country to the ports, and, broadly, it required a fortnight to load cargo ships.

The task of moving the necessary personnel fell on the railways, and the railways also moved a good deal of the stores. A conference was held before the expedition between the railways and the other parties, and three days were required to decide on the special trains needed, and timing them to fit in with the embarkation programme. Co-operation of the Port Authorities, the railway companies, the Ministry of War Transport, and the War Office Movements staff, was very efficient and had resulted in a very smooth working organisation.

Sir William Wood, in thanking Brigadier Napier for his address, said that he had seen a good deal of the movements involved, but it was the first time that he had heard it all brought together. The Ministry of War Transport and the nation were very happy in having Sir Cyril Hurcomb as Director-General of the Ministry of War Transport.

Among those present were:—

Messrs. W. J. Adkin, J. Atherton.

T. Barty, J. E. Beckett, R. Bezzant, J. M. Birch, R. W. Birch (Member of Council), C. W. Bowers, F. G. Bristow, C.B.E., F. M. Brock, Lt.-Colonel F. Bustard, O.B.E., Captain L. G. Burleigh.

E. L. Cadwallader, M. Campbell, F. L. Castle, B. W. C. Cooke, F. W. Crews (Secretary) H. H. Crow.

G. Dickenson, J. N. Drummond, J. A. Dunnage.

S. E. Garcke, C.B.E. (Past President), B. K. Gardiner, Major, H. S. Gardner, Mr. W. H. Gaunt, C.B.E., Lt.-Colonel I. R. Grove, Messrs. L. W. Gupwell (a Vice-President).

M. W. Harris, C. F. Haywood, P. S. Henman, H. Hoffman, H. Howells, Sir Cyril Hurcomb, K.C.B., K.B.E. (Past President), Messrs. G. Mackenzie Junner

J. A. Kay, J. A. Kirk, Lt.-Colonel L. H. Kirkness, C.I.E., D.S.O., O.B.E., Messrs, C. F. Klapper, W. C. Leslie-Carter (Member of Council).

R. McDonald, Lt.-Colonel Sir Alan Mount, C.B., C.B.E.

Brigadier C. F. Napier, O.B.E., Messrs. L. H. K. Neil (Member of Council), J. S. Nicholl, C.B.E. (Past President), Air Vice-Marshal Sir Hazelton Nicholl, C.B., C.B.E., Captain A. D. Nicholl, C.B.E.

Messrs. E. E. Painter, S. E. Pepler, J. Pike, O.B.E., H. J. Pyne.

J. W. Ramsbottom (Educational Adviser), F. J. Reynolds, C. A. Roberts M. D. Robinson, H. P. Robottom, Lt.-Colonel K. W. Round, Messrs. H. Rudgard, E. W. Rumble.

C. J. Selway, C.V.O., C.B.E. (Hon. Treasurer), H. Shankland, F. G. Sketch, G. W. Quick Smith, H. W. Smither, W. H. Speat, H. E. Stokes, G. S. Szlumper, C.B.E., T.D. (Past President).

T. E. Thomas, C.B.E. (Past President), J. H. Turner, Brigadier W. G. Tyrrell.

Messrs. A. B. B. Valentine (Member of Council).

B. Waddell, Captain H. D. Welch, Messrs. A. E. Wells, W. Cyril Williams, J. S. Wills, W. A. Winson, Sir William Wood (President).

Swedish State Railways Development Plans

Herr G. O. V. Dahlbeck, Chief of Administration, Swedish State Railways, stated recently that war conditions had delayed completion of the scheme adopted in 1938 to convert to double track the lines between Stockholm and Gothenburg and Katrineholm and Malmö. (The latter line branches off that between Stockholm and Gothenburg at Katrineholm. Figures of the mileages of these routes so far converted to double track are given on page 522 of our November 19 issue.) Continuing, Herr Dahlbeck said that, when peace conditions were restored, work on the doubling of tracks would be intensified; but in any event it was expected that during the next two years double tracks on the stretches Flen—Skebokvarn, Pålsboda—Hallsberg, and Skövde—Falköping, on the trunk line between Stockholm and Gothenburg, would be completed. Later, the lines Almedal—Kungsbacka, Örebro—Frövi, and Ockelbo—Bräcke would be doubled.

The work would be fairly expensive, as the excavation and planning works alone on the tracks mentioned would cost about kr. 90 million. The strengthening of lines and the replacement of rails came under the programme, and safety measures, already highly developed, were further to be improved by the construction of electrically-worked signal cabins of a new type. New stations were not included in the scheme, but Stockholm Central Station would be reconstructed and enlarged, due to the replanning of the city around the terminus.

Many locomotives, electric and steam, were to be bought; and rolling stock would have largely to be renewed, and the number of vehicles increased, although at the moment Sweden owned a great deal of rolling stock.

The bus services of the State Railways had had to be restricted, due to war conditions. After the war, the private railways, with their extensive bus services, gradually were to be amalgamated with the State Railway system.

Fast steam ferries were to be constructed for the trade between Trelleborg and Sassnitz. On October 16 a steam ferry had been launched for service between Malmö and Copenhagen.

Concerning electrification, Herr Dahlbeck stated that conversion of the line between Östersund and Storlien would have been finished by the beginning of 1946. When that had been completed, the State Railways would have 4,657 km. (2,892 miles) of electrified track. Among routes to be electrified, he mentioned the lines Varberg—Borås Herrljunga (75 miles); Borås—Alvesta (90 miles); Uddevalla—Vänersborg—Herrljunga (60 miles); Alvesta—Karlskrona (80 miles); Emmaboda—Kalmar (35 miles); Uddevalla—Strömstad (60 miles); Gävle—Sundsvall—Härnösand (170 miles); and Härnösand—Längsele (70 miles). The lines Kilafors—Söderhamn (25 miles), Hudiksvall—Ljusdal (40 miles), Boden—Haparanda (90 miles), and Karungi—Overtorneå (25 miles) might be converted to meet unemployment difficulties. (The distances given are approximate.)

ROAD ACCIDENTS IN OCTOBER, 1943—The return issued by the Ministry of War Transport of the number of persons reported to have died, or to have been injured, as a result of road accidents in Great Britain during the month of October last shows 488 deaths (compared with 697 in October, 1942), 2,870 seriously injured (compared with 3,369 in October, 1942), and 7,838 slightly injured (compared with 9,849 in October 1942).

Questions in Parliament

Christmas Railway Travel

Major A. M. Lyons (Leicester East—C.) on December 1 asked the Parliamentary Secretary, Ministry of War Transport, what steps were being taken to prevent increases of unnecessary passenger travel at Christmas.

Mr. P. J. Noel-Baker (Joint Parliamentary Secretary, Ministry of War Transport): On each day from December 23 until December 28, the number of long-distance passenger trains which each railway company may run, and the total train mileage of long distance passenger trains, will not exceed the number or mileage run on any ordinary weekday or Sunday, as the case may be, in December, 1942. Service leave will be adjusted to prevent travel by members of the Forces so far as practicable, on those days; civil servants will not be granted leave, unless they mean to spend it near their place of work; the arrangements for granting free or assisted travel to civilians, including evacuated civil servants, transferred civil defence workers, and relatives visiting evacuees, will be suspended. The few remaining restaurant cars will be withdrawn from December 22 until December 28. I am grateful to Major Lyons for this opportunity of reminding the House and the public that the strain imposed on our transport system by essential war needs will be greater during the coming winter than ever before. I trust that the public will understand that, if it makes unnecessary journeys, it will increase the load on our heavily burdened railways, and that it will probably meet with great difficulties and suffer great discomfort.

Mr. Campbell Stephen (Glasgow, Camlachie—I.L.P.): Will the Minister reconsider his decision, in view of the fact that there are all those Scottish girls transferred to England and that this is the only opportunity for them to get home to see their own people in that area?

Mr. Noel-Baker: I am afraid that many cases of what perhaps might be called hardship will arise, but I would ask Mr. Stephen to remember that the strain on railway travel and, above all, on train crews is very great, and we must not risk any interruption of essential services during the winter.

Mr. G. Mathers (Linlithgow—Lab.): Will the Minister take into account the special position of Scotland, where, within Scotland itself, there is not the same pressure on travel at Christmas time, and that it would be unwise to restrict for example, Service men and others and prevent them from having the opportunity of travelling at Christmas time when it would not be any serious tax upon the rail facilities?

Mr. Noel-Baker: The long-distance travel in Scotland is mainly from Scotland to England or *vice versa*.

Mr. Mathers: I am asking about the special conditions within Scotland itself.

Mr. Noel-Baker: I will have that matter looked into.

Shortage of Railway Wagons

Mr. Evelyn Walkden (Doncaster—Lab.) on November 30 asked the Minister of Fuel & Power what complaints he had received of coal production being delayed by shortage of railway wagons; and what percentage of the total pool of railway wagons were held up in repair yards for elaborate repairs.

Major G. Lloyd George (Minister of Fuel & Power): I have been kept fully informed of the losses of coal production which have occurred through shortage of railway wagons, chiefly in the North East and North Midland regions. To the week ended November 20 some 66,000 tons had been lost from this cause and wagon shortages also have been experienced at opencast workings. I am in the closest touch with the Minister of War Transport on this matter. As to the second part of the question, I am informed that according to the latest available figures, 5·37 per cent. of the total pool of railway-owned and privately-owned requisitioned wagons were under and awaiting repairs at the end of last month. The types of repairs required vary so much that it is not practicable to give separate figures for elaborate repairs.

Overhaul and Repair of Wagons

Mr. Evelyn Walkden (Doncaster—Lab.) on November 30 asked the Parliamentary Secretary, Ministry of War Transport, whether he had examined the allegations supplied by an expert in wagon repairs and sent to him by the Member for Doncaster; and what action he proposed to take to end the elaborate and costly methods which now obtained in the general overhauling and repairing of railway wagons.

Mr. Noel-Baker in a written answer stated: The allegations to which Mr. Walkden refers are being investigated, and I will communicate the result to him as soon as possible.

Southern Railway Train Lighting

Sir William Wayland (Canterbury—C.) on December 1 asked the Parliamentary Secretary, Ministry of War Transport, if he would approach the Southern Railway Company with the object of getting the lighting in the carriages of all the main-line trains between London and Dover furnished with four lamps at the back of seats and displacing the small blue lights and centre lights which preclude any attempt at reading.

Mr. Noel-Baker: I regret that in view of the present shortage of labour and material I should not be justified in authorising the Southern Railway to instal the lights for which Sir William Wayland asks in his question. The small blue lights are required because the white roof lights must be switched off when trains are in areas near the coast.

Sir W. Wayland: Is the Parliamentary Secretary aware that there has been no improvement in the lighting on the Southern Railway between London and Folkestone during the last twelve months?

Mr. Noel-Baker: It is not so easy as on some other lines, because these trains have to run into the coastal areas. We cannot undertake a large job which would take a big quantity of material and labour.

Sir Herbert Williams (South Croydon—C.): Is the Parliamentary Secretary aware that the trains from Victoria to Southampton which travel along the coast for 20 miles are very well lit?

Mr. Noel-Baker: I will inquire into that.

Lighting Outside London Termini

Major Sir Jocelyn Lucas (Portsmouth South—C.) on December 1 asked the Parliamentary Secretary, Ministry of War Transport, if his attention had been called to the difficulty experienced by troops and others in locating Kings Cross, Euston, and St. Pancras Stations, particularly in the black-out; and if he would have a shaded illuminated sign placed outside each station, as well as the names printed up in prominent positions.

Mr. Noel-Baker: I have received no complaints that troops and others have difficulty in finding Kings Cross, Euston, and St. Pancras. I will consider whether anything can be done to indicate by illuminated signs the approaches.

Sir J. Lucas: Is the Minister aware that night clubs can have illuminated signs, and that there should be no difficulty about stations having them?

Mr. Noel-Baker: That is a matter for the Minister of Home Security. I will do the best I can.

Women's Land Army Railway Fares

Mr. T. E. Naylor (Southwark South-east—Lab.) on December 1 asked the Parliamentary Secretary, Ministry of War Transport, if he would take steps to give members of the W.L.A. the same reduction in railway fares as to members of the Forces?

Mr. Noel-Baker in a written answer stated: Members of the Women's Land Army are employed by the farmers for whom they work, and the conditions of their service cannot, therefore, be compared with the conditions of service of members of the Women's Forces. For that reason, I regret that it would not be justifiable to extend to them the reductions in railway fares allowed to members of the Forces.

Severn Barrage Scheme

Mr. B. V. Kirby (Liverpool, Everton—Lab.) on November 30 asked the Minister of Fuel & Power whether he could now announce the names of the persons forming the technical body which he was appointing to consider the Severn Barrage Scheme proposals, including the conclusions of the Brabazon Committee; and what were the terms of reference.

Major G. Lloyd George (Minister of Fuel & Power): I have invited three eminent Engineers, whose names I hope to be able to announce shortly, to form a technical body with the following terms of reference: "To review the conclusions of the Severn Barrage Committee in the light of later engineering experience and practice and of other developments and to suggest what modifications, if any, should be made in the proposed scheme, in the programme for its execution and in the estimates of its cost."

Mr. Kirby: When is this body likely to start work?

Major Lloyd George: I am hoping to get acceptances in a day or two, and they will start work immediately.

Forth-Clyde Canal

Mr. R. J. G. Boothby (East Aberdeenshire—C.) on November 30 asked the Secretary of State for Scotland whether he was in consultation with the Minister of Reconstruction on the subject of the proposed Forth-Clyde Canal and similar schemes of national development in Scotland after the war.

Mr. T. Johnston (Secretary of State for Scotland): I am in consultation with the Minister of War Transport on the subject referred to in Mr. Boothby's question, and with the Minister of Reconstruction as to Scottish reconstruction questions generally.

Mr. Boothby: Can the Secretary of State say when he expects anything to emerge from the consultations?

Mr. Johnston: The Minister of War Transport, who sits in the House of Lords, has set up a small group to examine this question departmentally, and obviously it will be done as speedily as possible.

Mr. G. Mathers (Linlithgow—Lab.) on December 1 asked the Parliamentary Secretary, Ministry of War Transport, how many Scottish persons and organisations had been invited to give evidence to the departmental group appointed to consider the proposal for a Forth-Clyde ship canal.

Mr. Noel-Baker: The departmental group to which Mr. Mathers refers was appointed by the Minister of War Transport to review the recommendations made by the Mid-Scotland Ship Canal Committee in 1930. The group is not taking formal evidence, but it is open to any Scottish persons or organisations to submit their views to the Secretary of State for Scotland, who has a representative in the group.

Notes and News

Line Re-opened in India.—It is stated that services have been restored over the Bandel-Burdwan section of the East Indian Railway.

L.M.S.R. Locomotive Named.—At a ceremony at Leeds on December 2 the Lord Mayor of that city, Alderman A. Hayes, J.P., named L.M.S.R. express passenger locomotive No. 6248 *City of Leeds*.

Organising the Road-Transport Industry.—At a meeting of the Metropolitan Graduate & Student Society, Institute of Transport, at 2.15 p.m. on December 11, Mr. C. F. Klapper will speak on "Organising the Road-Transport Industry."

The South American Railway Congress.—The *Boletin de la Asociacion Internacional Permanente, Congreso Sud-americano de Ferrocarriles* has published details of the preliminary organisation meeting held earlier this year to plan the programme for the Fifth South American Railway Congress and the Second South American Engineering Congress, which are intended to be held in 1945.

South Indian Railway Co. Ltd.—Gross earnings for the year to March 31, 1943, were Rs. 7,92,06,796 (Rs. 6,69,10,062), working expenses were Rs. 3,65,64,257 (Rs. 3,08,67,276), and net earnings Rs. 4,26,42,539 (Rs. 3,60,42,786). The company's share of surplus profits was Rs. 16,58,089 (Rs. 11,97,697), less Rs. 13,88,089 (Rs. 10,22,697) retained for taxation. The balance remitted to England realised £20,215 (£13,102). On the capital stock the total distribution for the year 1943 is 4¼ per cent., made up of 1 per cent. from surplus profits and 3¼ per cent. from guaranteed interest. For the previous year the total distribution was the same.

General Railway Signal Co. Ltd.—Pursuant to Section 245 of the Companies Act, 1929, general meetings of the members and creditors of this company—now in voluntary liquidation—will be held at 11, Ironmonger Lane, E.C.2., on December 29 at 12 noon and 12.15 p.m. respectively to receive the accounts of the liquidator showing how the winding-up of the company has been conducted and its property disposed of, and to pass a resolution as to the disposal of the books, accounts, and documents of the company. The business of the company has been acquired by Metropolitan-Vickers Electrical Co. Ltd., and is being run as a totally-owned subsidiary of that company under the title of Metropolitan-Vickers-GRS Limited. Particulars of the acquisition were given on page 126 of our issue for January 29 last.

Tasman Air Traffic.—Some statistics recently issued by Tasman Empire Airways Limited indicate a high degree of operating regularity since the inception of the service between Sydney and Auckland, across the Tasman Sea, on April 30, 1940. The percentage of scheduled trips flown during the 3¼ years to June 30, 1943, is 97·87, and 100 per cent. in the year ended March 31 last. Since December, 1941, the connection at Sydney with the Empire service to and from Great Britain has been severed, of course. Until the entry of Japan into the war, connection was also made at Auckland with the Pan-American service to the U.S.A., begun on July 12, 1940. Tasman Empire Airways Limited was formed in 1940 with a capital of £500,000, of which 39 per cent. was held by Union Airways of New Zealand Limited, on behalf of the New Zealand Government; 38 per cent. by the British Overseas Airway Corporation on behalf of Great Britain; and 23 per cent. by Qantas Empire Airways Limited on behalf of Australia.

Electromagnets Limited.—This company, which designs and manufactures all types of electro-magnetic equipments, lifting magnets, clutches, chucks, and magnetic separators for all purposes, is moving into offices at No. 1, Bond Street, Hockley, Birmingham.

International Railways of Central America.—Railway operating revenues for the period January 1 to October 31 1943 were $6,023,847 an increase of $951,053 in comparison with the corresponding period of 1942. Net revenue from railway operations amounted to $2,173,899 an improvement of $391,420. Income available for fixed charges was $264,290 higher at $2,773,899 and the net income of $1,493,027 was $313,506 greater than for the corresponding period of 1942.

Examinations for Prisoners-of-War.—The Institution of Mechanical Engineers announces that, thanks to arrangements made by the War Organisation of the British Red Cross and the Order of St. John of Jerusalem, 37 candidates recently sat for the Institution's examinations in prisoner-of-war camps in Germany, of whom 34 passed with an exceptionally high average-percentage markings. The results reflect credit both on the candidates, and on members of the Institution and others in the camps who organised classes and acted as instructors.

Passenger Transport in Newfoundland.—We have recently made numerous references to traffic increases on the Newfoundland Railway, and to the efforts to secure additional rolling stock. Recent messages indicate that passenger transport facilities continue to be congested. Four petrol-engined railcars, each with a seating capacity for 40 persons, have been obtained. Two work between Corner Brook and Stephenville and two between St. John's and Argentia. The weekly train service across the Island from St. John's to connect at Port-aux-Basques with the ferry service across the Cabot Strait to Canada has been increased.

Voluntary Winding-up of Leyland Associates.—Notice is given that in pursuance of Section 236 of the Companies Act, 1929, general meetings of the members of Orient Transport Limited and of Lancashire Steam Motor Co. Ltd., respectively—both of which companies have been associated with Leyland Motors Limited and are now in voluntary liquidation—will be held on Friday, December 17, at the offices of Leyland Motors Limited, Leyland, Lancs. The purpose of each meeting is to receive an account showing the manner in which the winding-up has been conducted and the property of the company disposed of, and of hearing any explanation that may be given by the Liquidator.

Thos. W. Ward Limited.—Mr. Ashley S. Ward (Chairman & Managing Director), in the course of his address at the 40th ordinary general meeting, said that the company, together with its subsidiary and associated companies, had been more busily employed than ever. The acquisition of the Deighton Motor Company was developing quite well on the lines he had indicated last year. During the course of the year the old-established concern of the Ince Forge Company, of Wigan, had been acquired, and it continued to be busily employed. Regarding the proposal to reduce the final ordinary dividend from 7½ per cent. to 6½ per cent., the directors had in view contingent obligations in the matter of taxation and had still further considered the future stability of the undertaking by taking a conservative view of all the accounts. Every consideration was being given to the possibility of post-war trade, and he was of opinion that the company's wide facilities would be in enormous demand when peace came along.

Condenser Tubes Patent Extension Application.—The British Non-Ferrous Metals Association (as assignee of the letters patent granted on December 24, 1927, to

British and Irish Railway Stocks and Shares

Stocks	Highest 1942	Lowest 1942	Prices Dec. 3, 1943	Prices Rise/Fall
G.W.R.				
Cons. Ord.	58	39	62	+ ½
5% Con. Pref. ...	115½	105½	116	+ ½
5% Red. Pref. (1950)	109½	103½	107	—
5% Rt. Charge ...	133½	123½	128½	—
5% Cons. Guar. ...	130½	121½	126½	—
4% Deb.	117	105	113	—
4½% Deb.	118	108	113½	—
4½% Deb.	125	113	118½	—
5% Deb.	137	127	130½	—
2½% Deb.	77	70	74½	—
L.M.S.R.				
Ord.	28½	16⅜	33	+ ½
4% Pref. (1923) ...	63½	50½	62	—
4% Pref.	76½	67½	76	—
5% Red. Pref. (1955)	103½	94½	103½	—
4% Guar.	104½	97½	100	—
4% Deb.	108½	101½	105½	—
5% Red. Deb. (1952)	111	107½	109½	—
L.N.E.R.				
5% Pref. Ord. ...	9¾	2⅞	10⅜	+ ⅜
Def. Ord.	5	1⅜	5	+ ⅛
4% First Pref. ...	62	49½	61	—
4% Second Pref. ...	32½	18½	33½	+ ½
5% Red. Pref. (1955)	95½	79	98½	—
4% First Guar. ...	98	88	96½	+ ½
4% Second Guar. ...	90	78	88	—
3% Deb.	85	76	82	—
4% Deb.	106⅜	100½	104½	—
5% Red. Deb. (1947)	106	103	103	—
4½% Sinking Fund Red. Deb.	106	102½	105½	—
SOUTHERN				
Pref. Ord.	77	61½	77½	—
Def. Ord.	23½	14½	23½	— 1
5% Pref.	112½	104	115	+ 1
5% Red. Pref. (1964)	110⅜	105½	112½	—
5% Guar. Pref. ...	131	121½	125½	—
5% Red. Guar. Pref. (1957)	115½	109½	112½	—
4% Deb.	116	104½	111	—
5% Deb.	134	125½	128	—
4% Red. Deb. (1962-67)	110½	106	108½	+ 1
4% Red. Deb. (1970-80)	111	106½	109½	+ 1
FORTH BRIDGE				
4% Deb.	109 7/16	108	106	—
4% Guar.	105½	100	103½	—
L.P.T.B.				
4½% "A"	122½	111	117⅛	—
5% "A"	131½	122	126⅛	—
3% Guar. (1967-72)	95⅜	97⅛	98⅛	— ½
5% "B"	121	111½	117⅛	—
"C"	56½	38	66	— 1
MERSEY				
Ord.	27½	20½	33	+ 1
3% Perp. Pref. ...	61½	56½	66	+ 2
4% Perp. Deb. ...	102½	99½	103	—
3% Perp. Deb. ...	80½	76	79	—
IRELAND				
BELFAST & C.D.				
Ord.	9	4	6½	— ½
G. NORTHERN				
Ord.	29½	12½	21	— ½
Pref.	—	—	43½	+ 1½
Guar.	—	—	60 7/16	—
Deb.	—	—	81¼	— ¼
G. SOUTHERN				
Ord.	25	10	25	+ ½
Pref.	29	12½	27	+ 1½
Guar.	53	35½	58	—
Deb.	71½	55½	84½	+ ½

§ ex-dividend

OFFICIAL NOTICES

London and North Eastern Railway

In Parliament
Session 1943-44.

NOTICE IS HEREBY GIVEN that application has been made to Parliament in the present Session by the London & North Eastern Railway Company for an Act under the above name or short title intituled "A Bill to authorise the London and North Eastern Railway Company to establish a savings bank for their employees and others and to amalgamate therewith the existing savings banks maintained by the Company; and for other purposes."

A notice containing a concise summary of the purposes of the intended Act has been or will be published in *The Times*, *Scotsman* and *Glasgow Herald* newspapers of the 1st and 8th December, 1943.

A printed copy of the Bill for the intended Act may be inspected and copies thereof obtained at a price not exceeding one shilling for each copy at the undermentioned offices and at the office of the Company's Solicitor (Scotland), 23, Waterloo Place, Edinburgh.

Dated this 6th day of December, 1943.

MILES BEEVOR,
4, Cowley Street,
Westminster, S.W.1.
Chief Legal Adviser.
SHERWOOD & CO.,
13/15, Old Queen Street,
Westminster, S.W.1.
Parliamentary Agents.

OFFICIAL ADVERTISEMENTS

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. The charge for these advertisements is 2d. per word with a minimum of 10 shillings for each insertion. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

Robert Samuel Hutton in respect of "improvements in and relating to the manufacture of condenser tubes and the like") and Robert Samuel Hutton intend to present a petition to the High Court of Justice, praying for the extension of the term of the above-named letters patent. Counsel for the petitioners will on December 17 apply to the Court for a day to be fixed before which the petition will not be in the paper for hearing by Mr. Justice Simonds.

The O. C. Power Memorial.—A committee has been formed to perpetuate by some form of memorial the memory of Mr. O. Cecil Power. Those of Mr. Power's friends who desire to be associated with this object should communicate with Mr. J. P. Savage, the Secretary of the Committee, at the offices of the Birmingham & Midland Motor Omnibus Co. Ltd., Bearwood, Birmingham, and make any cheques payable to the "O. C. Power Memorial Fund."

Post-War Development of the Internal Combustion Engine.—At a general meeting of the Diesel Engine Users Association to be held at Caxton Hall on December 16, at 2.30 p.m., a discussion on the "Post-War Development of the Internal-Combustion Engine" will take place. The object of the meeting is to indicate users' requirements and the possibilities of their fulfilment. Discussions will be opened under the heads of (1) stationary, (2) marine, and (3) rail traction by (1) Messrs. C. Pain and A. C. Yeates, (2) Messrs. W. S. Burn and J. Calderwood, and (3) Messrs. T. Hornbuckle and L. H. Short.

The Turkish Earthquake. — The earthquake which shook one region of Asiatic Turkey recently, and which has resulted in some thousands of fatalities, is now reported to have destroyed about 18 miles of railway.

Repairs to Girder Bridges.—At a meeting of the Manchester & Liverpool Section of the Permanent Way Institution, to be held in the staff dining room, Hunt's Bank, Manchester, on December 11, at 2.30 p.m., a lecture on "Repairs to Girder Bridges" will be given by Mr. G. E. Woodhead, A.M.Inst.C.E., A.M.I.Struct.E., Resident Engineer for Bridges, L.M.S.R.

"Railway Civil Engineering Accounts."—A meeting of the Permanent Way Institution, London Section, is to be held at St. Pancras Chambers, in the Conference Room (No. 168) on the third floor, on Saturday, December 11, at 3 p.m., at which a Paper on "Railway Civil Engineering Accounts" will be presented by Mr. F. Lawson, of the L.N.E.R., Hon. Treasurer of the P.W.I.

L.M.S.R. Overcomes Fog.— Despite widespread fog over the Midland and Southern Areas of the L.M.S.R. during the latter half of October 1,572,819 loaded wagons were worked during the month from stations and sidings served by the company—the highest monthly total since 1940. This figure does not include the many wagons passed to the L.M.S.R. by other railways.

L.N.E.R. Bill.—The London & North Eastern Railway Company is applying to Parliament for a Bill which proposes to empower the company to establish a new savings bank for its employees and others and to amalgamate therewith the existing savings banks maintained by the company. It is also sought to amend Section 16 of the L.N.E.R. Act, 1929, so as to provide that for the purposes of any actuarial calculation or certificate made or given in pursuance of that section account shall be taken of the principal moneys and investments standing in the books of the Company to the credit of the Great Eastern Railway New Pension Fund or the Great Eastern Railway New Pension (Supplemental) Fund in the trust account created under a certain deed of trust executed by the Company and dated November 7, 1941. (*See Official Notice above*).

L.M.S.R. (Canals) Bill.—Notice is given that the London Midland & Scottish Railway Company has applied to Parliament for leave to bring in a Bill for the following purposes:—(1) Closing to navigation the following canals or parts of canals: part of the Huddersfield Narrow Canal; the Ulverston Canal; the Coalport Canal; part of the Lancaster Canal; the Leek Branch of the Trent & Mersey Canal; part of the Cromford Canal; part of the Ashby Canal; part of the Shropshire Union Canal in the Counties of Montgomery, Salop, Denbigh, Flint, Chester, and Stafford. (2) Transfer of the Huddersfield Broad Canal and part of the Huddersfield Narrow Canal in the West Riding of Yorkshire to the Company of Proprietors of the Calder & Hebble Navigation. Application of the Calder & Hebble Canal Acts to the transferred Canals. (3) To provide that provisions in Canal Acts similar to those contained in Sections 127 to 131 inclusive of the Lands Clauses (Consolidation) Act, 1845, shall cease to apply to any land now vested in the railway company. (4) Application, amendment, or repeals of Acts.

New L.N.E.R. Canteen at Edinburgh.—Mr. E. D. Trask, Locomotive Running Superintendent, Scottish Area, L.N.E.R., in the presence of other L.N.E.R. officers and union officials, on November 30 inaugurated a canteen at Haymarket Locomotive Sheds for the service of meals to staff employed at that centre, the second canteen to be opened by the company in Edinburgh in recent months. The building possesses all advantages of modern construction. There is considerable window space, and a decorative colour-scheme for the well-ventilated dining room. Electric lighting and gas heating-appliances are installed. Forty-eight persons can be accommodated at a sitting; and, of a staff of 670, it is expected that many will avail themselves of the facility. The kitchen is designed to lighten the tasks of the catering employees, who are assisted by diners carrying their meals from service counter to tables. A 24-hr. service has been instituted. The catering arrangements are in the hands of a contractor with considerable experience in this class of business. At canteens now in service on the L.N.E.R. system over 7,500 persons can be accommodated at a time, and some 14,000 hot dinners (apart from other meals) are served every day.

Contracts and Tenders

Below is given a list of orders placed recently by the Egyptian State Railways:—

James A. Jobling & Co. Ltd.: Lenses.
British Ropes Limited: Steel wire cable.
I.C.I. Metals Limited: Brass bars.
Taylor Bros. & Co. Ltd.: Axles.
Budenberg Gauge Co. Ltd.: Steam pressure-gauges.
Bayliss, Jones & Bayliss Limited: Wood screws.
Elliott Bros. (London) Ltd.: Alloy.
Albert Jagger Limited: Carriage spares.
Hayward Co. (Addressing Machines) Ltd.: Stencil cards.
James Chesterman & Co. Ltd.: Measuring tapes.
John Rabone & Sons Ltd.: Measuring tapes.
L.P.S. Electrical Co. Ltd.: Cordage, telephone, and telegraphic materials.

Railway Stock Market

Sentiment in the stock and share markets reflected satisfaction with the important conferences undertaken by leaders of the United Nations, and values in most sections were inclined to improve. Nevertheless, the volume of business showed no appreciable change. Home railway junior stocks tended to improve, but movements on balance were mostly fractional. The better trend in prior charges was continued, and a further number of gains were recorded; buyers were attracted by the yields offered, which compare favourably with the return on other stocks having front rank investment merits. The yield on Great Western 5 per cent. preference, for instance, is over 4¼ per cent., and that on Southern 5 per cent. preference fully 4⅜ per cent. Moreover, L.N.E.R. first guaranteed yields over 4 per cent., and the second guaranteed nearly 4½ per cent. Among debentures, L.M.S.R. 4 per cents. return over 3¾ per cent., and Southern 4 per cents. fully 3⅝ per cent. Yields on junior stocks continue to be substantial, and out of line with those on other equity securities. L.M.S.R. ordinary yields well over 7½ per cent. and Southern deferred over 7⅛ per cent. The fact that the yield on Southern deferred is below that on other home railway juniors is not due to the possibility of a higher dividend, but to the fact that as Southern deferred is the smallest priced home railway stock in the dividend list, it attracts a fair amount of speculative attention as a means of participating in the general trend in stocks of the main-line railways. According to some views, there may be possibilities of a fractionally better dividend in the case of L.N.E.R. second preference, and also perhaps on L.M.S.R. ordinary; but this would turn on the amount of revenue accruing from ancillary sources not included in the fixed rental. L.N.E.R. second preference may have interesting possibilities, bearing in mind that, if there were modification of the financial agreement to permit L.N.E.R. preferred and deferred receiving a dividend, the second preference would presumably have to receive its full 4 per cent. It cannot be assumed that efforts to modify the agreement will be successful. Last year the payment on L.N.E.R. second preference was 2⅝ per cent. This is the only home railway preference not in receipt of its full dividend. The maximum that could be expected on this stock, even if ancillary receipts increased would apparently be 2⅞ per cent. At its current level of 33½, however, the yield is 7¾ per cent. on the basis of the dividend for last year.

Compared with a week ago, Great Western ordinary has eased from 61¾ to 61½ at the time of writing. Great Western 4 per cent. debentures improved from 112½ to 113, the guaranteed stock from 127 to 127½, and the 5 per cent. preference from 115½ to 116. L.M.S.R. ordinary did not keep best prices, but at 33 was slightly higher on balance; the senior preference was better at 76¼, and the 1923 preference unchanged at 61½. L.M.S.R. guaranteed continued to be quoted at par. The increased efforts to obtain equitable treatment for holders of L.N.E.R. junior stocks were reflected by further improvement from 4⅞ to 5 in the deferred and from 10¼ to 10½ in the preferred. L.N.E.R. second preference was better at 33½ compared with 33⅜ a week ago, but the first preference at 60½ was unchanged on balance. This railway's first guaranteed improved from 96 to 97; the second guaranteed remained at 88. Among Southern stocks, the deferred strengthened from 24 to 24⅜, but the preferred eased to 77. Southern 4 per cent. debentures were slightly lower at 110½ when "ex" the interest payment. The guaranteed stock was higher at 126½, and the 5 per cent. preference improved from 114½ to 115. Elsewhere, London Transport "C" reacted from 66½ to 65¾.

Publication of the annual reports had little influence on stocks of the Argentine railways, except in the case of Central Argentine. Compared with a week ago this company's ordinary stock improved from 8½ to 9¼, the 6 per cent. preference from 27 to 29, the 4 per cent. debentures from 52 to 55, and the 5 per cent. debentures from 45 to 47½. Elsewhere, Leopoldina debentures went back to 54, and United of Havana debentures to 32½. San Paulo ordinary improved to 59½, and Canadian Pacifics to 15½.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ending	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1941/2	No. of Weeks	Aggregate traffics to date: Totals 1942/3	Aggregate traffics to date: Totals 1941/2	Aggregate traffics to date: Increase or decrease	Shares of stock	Prices: Highest 1942	Prices: Lowest 1942	Prices: Dec. 3, 1943	Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chil) & Bolivia	834	28.11.43	31,940	+ 7,340	48	1,361,040	1,028,070	+ 332,970	Ord. Stk.	14	7⅜	13¾	Nil
	Argentine North Eastern ...	753	27.11.43	14,364	+ 1,860	22	307,080	296,424	+ 10,656	..	6¼	3	7	Nil
	Bolivar	174	Oct., 1943	5,144	— 1,286	44	52,813	47,139	+ 5,674	6 p.c. Deb.	19¾	10	21¼	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	20¼	9	20	Nil
	Bue os Ayres & Pacific ...	2,807	27.11.43	102,900	+ 2,100	22	1,997,700	1,915,620	+ 82,080	Ord. Stk.	7¼	4	6½	Nil
	Buenos Ayres Great Souther.	5,080	27.11.43	183,360	+ 7,080	22	3,319,4 0	3,030,420	+ 289,020	Ord. Stk.	12¼	7⅛	14½	Nil
	Buenos Ayres Western ...	1,930	27.11.43	56,640	— 5,880	22	1,099,920	1 124,580	— 24,660	..	12¾	6	12½	Nil
	Central Argentine	3,700	27.11.43	164,193	+ 21,984	22	2,95 ,726	2,706,780	+ 245,9 6	..	9¼	4 1/16	9	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	3¾	2½	4	Nil
	Cent. Uruguay of M. Video	972	27.11.43	35,195	+ 8,732	22	683,781	479,426	+ 204,355	Ord. Stk.	8	4	6½	Nil
	Costa Rica	262	Oct., 1943	22,459	+ 9,328	17	94,493	51,375	+ 43,118	Stk.	16½	11	15	Nil
	Dorada	70	Oct., 1943	21,800	+ 2,330	43	218,607	157,175	+ 61,432	1 Mt. Db.	90½	89	95½	6 5/8
	Entre Rios	808	27.11.43	19,170	— 210	22	428,934	403,368	+ 25,566	Ord. Stk.	33	4½	7	Nil
	Great Western of Brazil ...	1,030	27.11.43	24,100	+ 5,800	48	790,700	546,900	+ 243,800	Ord. Sh.	9/-	9/-	29/9	Nil
	International of. Cl. Amer.	794	Oct., 1943	$511,566	+ $72,075	43	$6,023,847	$5,072,794	+ $951,053	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	1¼	5/3	2	Nil
	La Guaira & Caracas... ...	22¼	Oct., 1943	6,900	— 1,670	44	83,360	71,925	+ 11,435	5 p.c. Deb.	11¼	5	87	Nil
	Leopoldina	1,918	27.11.43	44,180	+ 12,243	43	1,679,451	1,450,302	+ 229,1 9	Ord. Stk.	6¾	3½	6½	Nil
	Mexican	483	21.11.43	ps. 278,700	+ ps. 12,600	21	ps. 7,987,400	ps. 5,854,400	+ ps. 2,133,000	Ord. Stk.	1	½	1	Nil
	Midland Uruguay	319	Aug., 1943	14,706	+ 4,213	41	31,160	23,107	+ 8,053	—	—	—	—	—
	Nitrate	382	15.11.43	8,776	+ 728	46	137,471	172,058	— 34,587	Ord. Sh.	77/-	3½	72/6	Nil
	Paraguay Central	274	26.11.43	$4,921,000	+ $1,055,000	22	$11 ,087,000	$ .0,654,000	+ $33, 33,000	Pr. Li. Stk.	53	40	70	8 7/8
	Per vian Corporation ...	1,059	Oct., 1943	102,818	+ 17,072	18	417,026	336,988	+ 80,038	Pref.	19⅞	5½	12½	Nil
	Salvador	100	Sep., 1943	c 69,000	+ c 14,000	13	c 268,000	c 183,000	+ c 85,000	—	—	—	—	—
	San Paulo	153½	21.11.43	44,523	+ 7,375	47	2,057,118	1,737,709	+ 319, 09	Ord. Stk.	59	41	59½	3⅜
	Taltal	160	Oct., 1943	5,345	+ 2,165	17	22,250	19,840	+ 2,410	Ord. Sh.	41/-	23/-	25/-	Nil
	United of Havana	1,301	27.11.43	42,199	— 14,873	22	1,013,706	901,366	+ 112,340	Ord. Stk.,	8¼	2½	4½	Nil
	Uruguay Northern	73	Aug., 1943	1,451	+ 395	9	2,838	2,198	+ 640	—	—	—	—	—
Canada	Canadian Pacific	17,034	30.11.43	1,815,£00	+ 378,200	48	53,965,000	46,468,200	+ 7, ,96,£00	Ord. Stk.	16¾	9 7/16	15¼	Nil
India†	Barsi Light	202	Aug., 1943	15,285	+ 2,003	22	107,055	76,587	+ 30,468	—	—	—	—	—
	Bengal-Nagpur	3,267	Oct., 1943	1,001,025	+ 138,600	30	7,20 ,525	6,162,825	+ 1,0 6,700	Ord. Stk.	102¼	88	10 1/4	3 5/16
	Madras & Southern Mahratta	2,939	30.9.43	28 ,700	+ ,267	26	5,036,024	4,294,656	+ 741,368	..	105½	87	107½	6 5/16
	South Indian	2,349	31.10.43	203, 79	+ 17,598	30	4, .14,375	3,709,442	+ 504,933	..	103¾	88⅞	107½	4 7/16
Various	Egyptian Delta	—	10.10.43	16,936	+ 3,447	29	274,860	211,096	+ 63,764	Prf. Sh.	5¼	1¼	3¼	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	44	35	43½	13 11/16
	Midland of W. Australia ...	277	Sep., 1943	31,269	+ 3,556	13	101,693	84,321	+ 17,372	Inc. Deb.	95	90	100	6
	Nigerian	1,900	28.8.43	80,062	+ 29,036	21	1,398,693	1,212,844	+ 185,849	—	—	—	—	—
	South Africa	13,291	2.10.43	851,417	+ 61,474	27	22,232,795	20,514,452	+ 1,718,343	—	—	—	—	—
	Victoria	4,774	May, 1943	1,432,673	+ 67,979	—	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of 1/16. Argentine traffics are given in sterling calculated @ 16⅜ pesos to the £
† Receipts are calculated @ 1s. 6d. to the rupee § ex dividend